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CEO Stock Option Exercises: Private Information and Earnings Announcements

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CEO Stock Option Exercises: Private Information and Earnings Announcements

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by

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«L'Université n'entend ni approuver, ni désapprouver les opinions particulières du candidat».

«The University neither approves nor disapproves the opinions of the candidate».

To my dear parents ...

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French Summary

Un problème d'agence caractérise la relation entre le principal (les actionnaires) et l'agent (le dirigeant). Si ces derniers sont supposés agir pour maximiser la valeur de l'entreprise et ainsi la richesse des actionnaires, les dirigeants peuvent pourtant opter pour un comportement égoïste ou opportuniste (Jensen and Meckling (1976)). Afin d'atténuer ce problème d'agence et inciter les dirigeants à agir dans l'intérêt des actionnaires, les conseils d'administration des entreprises peuvent utiliser plusieurs mécanismes : rémunération fixe et variable, report de la partie variable du salaire, ou encore ajout de conditions contractuelles sur le licenciement. Le plus souvent, les conseils d'administration choisissent de lier la rémunération de leurs dirigeants à la performance de l'entreprise en attribuant des actions et des stock-options dont les valeurs sont directement liées à la performance (Fama (1980), Jensen and Murphy (1990), Haugen and Senbet (1981), Core and Guay (1999)). Si les stock-options sont souvent utilisées, cet instrument de rémunération suscite pourtant une forte contestation (Aboody and Kasznick (2000)). Contestation alimentée par plusieurs scandales très médiatisés ; à titre d'illustration nous pouvons citer le scandale d'ENRON, le backdating des options chez Apple, ou encore l'affaire des exercices d'un grand nombre d'options chez EADS avant l'annonce du retard de livraison de l'A380.

Les stock-options sont des options d'achat de type américain qui sont attribuées avec une durée de vie de 10 ans. Elles donnent le droit d'acquérir les actions de l'entreprise à un prix réduit, prix d'exercice défini le jour de l'attribution des options. Les détenteurs de stock-options peuvent les exercer pendant environ six ans, de la date de "Vesting" (disponibilité) jusqu'à la date d'expiration. Le plan des stock-options précise le nombre d'options attribuées, le prix d'exercice des options ainsi que toutes les conditions particulières liées à l'exercice des options.

A partir de la date de vesting et dès lors que le prix de l'action dépasse le prix d'exercice, les détenteurs des options peuvent les exercer. Ils réalisent, ainsi, un gain d'acquisition qui est égal à la différence entre le prix du marché et le prix d'exercice. Suite à l'exercice des stock-options, les détenteurs peuvent, sauf obligation de détention, revendre immédiatement les actions obtenues. Si la vente des actions intervient à un prix plus élevé que le prix d'acquisition, un gain de vente est alors réalisé. Ces gains d'acquisition et de vente sont sous soumis à l'impôt sur le revenu. Le paiement de cet impôt n'est cependant exigible qu'après la vente des actions : en gardant les actions acquises via les stock-options les dirigeants peuvent alors différer le paiement de cet impôt. Il faut enfin noter qu'en France, si la période de détention des actions est supérieure ou égale à deux ans, les gains d'acquisition et de vente sont soumis à un régime fiscal plus favorable ainsi qu'à des abattements.

Il existe peu d'études sur le comportement d'exercice des stock-options des dirigeants. Par ailleurs aucune de ces études, essentiellement anglo-saxonnes, ne tient compte à la fois de la durée restante des stock-options et de l'usage prévu des actions sous-jacentes du fait de la non disponibilité de données détaillées sur les plans de stock-options et leurs exercices. Dans cette étude, des données détaillées ont été collectées manuellement depuis les documents de référence des entreprises.

La question centrale de cette thèse porte sur les incitations des dirigeants à exercer leurs stock-options. Plus précisément, elle explore d'une part le lien entre les informations privées des dirigeants sur la performance future de l'entreprise et leur décision d'exercice des stock-options, et d'autre part le lien entre les annonces de résultats et l'exercice des options.

Le premier chapitre de la thèse détaille les stock-options avant d'étudier et analyser la littérature sur les comportements des dirigeants lors des exercices des stock-options et sur les stratégies de diffusion d'informations auprès des investisseurs. Le deuxième chapitre approfondit empiriquement le comportement des dirigeants lors d'exercice de stock-options pour les entreprises de l'indice boursier SBF 120. Enfin, le troisième chapitre, traite empiriquement la relation entre la décision d'exercice des stock-options, l'usage prévu des actions obtenues et la divulgation d'informations sur le marché. Combinés, ces trois chapitres ont pour objet de mieux appréhender le comportement des dirigeants.

Chapitre 1 : Stock Option Awards and Exercises: A Survey

Ce chapitre constitue un apport à la littérature existante sur l'exercice des stock-options des dirigeants en mettant en perspective les études menées sur le sujet qui traitent différents aspects de l'exercice des stock-options : le comportement des exercices des stock-options et la divulgation d'informations autour des exercices des stock-options des dirigeants.

Le premier chapitre permet dans un premier temps une description détaillée des processus d'attribution et d'exercice des stock-options, des différents gains obtenus suite à l'exercice des options et la revente des actions acquises ainsi que de la fiscalité des gains obtenus. Dans un second temps une revue de littérature développe plus particulièrement nos connaissances sur trois sujets : (i) l'attribution et l'exercice des stock-options, notamment les études sur le comportement des dirigeants ; (ii) le timing des attributions et des exercices ; (iii) l'utilisation et la divulgation d'informations autour de l'attribution et de l'exercice des stock-options.

Le premier chapitre permet de clarifier les recherches passées sur le sujet et d'identifier des perspectives de recherches, dont trois principalement sont explorées dans le reste de la thèse.

Premièrement cette synthèse de la littérature montre notamment que les recherches précédentes n'ont pas combiné l'usage des actions obtenues suite à l'exercice des stock-options et la durée de vie restante des stock-options exercées (Aboody et al. (2008), Cicero (2009)).

Deuxièmement les études sur les stock-options mettent en lumière l'effet pervers de la rémunération en options. Dans ce cas les dirigeants agissent de façon opportuniste autour de l'attribution et de l'exercice des stock-options afin de maximiser leur profit. Ils peuvent par exemple utiliser des informations privées pour choisir le moment opportun afin de se faire attribuer ou exercer leurs options. Ils peuvent aussi jouer sur le timing de la communication des informations obligatoires et volontaires pour orienter la valeur de la firme et donc le prix de l'action (Aboody and Kasznick (2000), Cicero (2009), Brockman et al. (2010), Lie (2005), Yermack (1997)).

Troisièmement, quand leurs incitations sont élevées, les dirigeants peuvent se livrer à des manipulations de résultats. Cette manipulation sera d'autant plus forte lorsque les options sont proches de leur date d'expiration (Chapitre 3). Cela pose dès lors la question du contrôle dans les entreprises. Des études antérieures ont trouvé des résultats contradictoires sur le rôle de

la gouvernance d'entreprise et le comportement des dirigeants (Sautner and Weber (2011), Chapitres 2 et 3).

Chapitre 2 : Executive Stock Option Exercises and CEO Private Information

La littérature étudie le lien entre utilisation d'informations privées et le timing des exercices de stock-options. De par le manque de données détaillées, la plupart des études considèrent que les dirigeants vendent les actions obtenues suite aux exercices des stock-options, ce qui n'est pas toujours le cas. Les dirigeants peuvent choisir de garder les actions obtenues pendant un certain temps. Si les exercices suivis de ventes d'actions sont basés sur des mauvaises nouvelles privées, cela devrait se refléter dans une performance anormale négative dans la période post-exercice (Carpenter and Remmers (2001), Huddart and Lang (2003)). N'ayant pas trouvé une performance anormale négative, ces études ont conclu que les exercices des dirigeants ne reflètent pas l'utilisation des informations privées. D'autres études observent pourtant une performance anormale positive dans la période de post-exercice pour les exercices suivis par la détention des actions et une performance anormale négative pour les exercices suivis par la vente des actions obtenues (Aboody et al. (2008), Cicero (2009)). Ces études concluent que les dirigeants exercent leurs stock-options et détiennent les actions lorsqu'ils s'attendent à une bonne performance des cours de l'action dans le futur. Cependant, ces études considèrent que toutes les options sont exercées plusieurs années avant l'expiration, elles ne tiennent pas compte de la durée de vie restante aux stock-options ; elles assument en effet que la décision d'exercice est indépendante de la durée de vie restante ce qui ne permet pas de distinguer les exercices motivés par l'expiration des autres exercices. Tenir compte de la durée de vie restante des stock-options nous permet de différencier les exercices générés par l'expiration des autres exercices générés par des informations privées par exemple.

Pour combler ce problème méthodologique le Chapitre 2 de la thèse étudie le comportement d'exercice des stock-options des dirigeants (PDG/DG) des entreprises françaises de l'indice SBF120. L'utilisation de données françaises est ici essentielle car elles fournissent le détail sur les stock-options et la rémunération des dirigeants. Ces données ont été collectées manuellement à partir des documents de référence des entreprises et des déclarations des

transactions des dirigeants à l'AMF (Autorité des Marché Financiers) pour une période allant du 1er janvier 2007 au 31 décembre 2014. Grâce à cette singularité ce chapitre fournit un test plus net pour l'utilisation de l'information privée en distinguant les exercices qui sont plus ou moins susceptibles d'être entraînés par des informations privées. Cette distinction est possible en différenciant les exercices en fonction de leur durée de vie restante jusqu'à l'expiration. Par conséquent, si les exercices d'options sont entraînés par des informations privées, les performances de l'action suivant les exercices d'options effectuées à proximité de l'expiration devraient être différentes des autres.

Ce chapitre examine les stratégies d'exercice de stock-options en tenant compte, d'une part l'usage des actions obtenues suite à l'exercice des options (détention ou vente immédiate), d'autre part la durée de vie restante des options. L'objectif est de tester les hypothèses identifiées par la littérature pour expliquer les raisons sous-jacentes à l'exercice des options par les dirigeants : durée de vie restante, informations privées, ou juste besoin de liquidité et/ou de diversification ?

Une étude d'événement permet de mieux comprendre d'une part les incitations des dirigeants à manipuler leurs exercices de stock-options et d'autre part leur capacité à choisir le moment opportun pour exercer leurs stock-options.

Un premier test porte sur le lien entre la décision d'exercice et l'évolution des prix de cette action sur le marché. Les résultats montrent que les exercices des stock-options interviennent peu de temps après une augmentation des prix du titre : les rendements anormaux sur les 20 jours précédents l'exercice sont de 2 % (CAR[-20; -1] = + 2 %), les dirigeants exercent leurs options après une augmentation des prix, ce qui pourrait être dû à un besoin de liquidité ou de diversification. Lorsque le prix de l'action augmente suffisamment, les dirigeants exercent leurs options. On note également une légère hausse après les exercices des options (CAR[+1; +20] = + 0,48 %), ce qui est cohérent avec l'hypothèse de "Market Timing". Les dirigeants ont donc la capacité de choisir le moment opportun pour exercer leurs options. Sur le long terme, les exercices sont suivis par une performance positive de 1,93 %. Si les exercices des stock-options sont générés par des informations privées sur le futur, nous devrions observer une performance négative sur le long terme. Cependant, les exercices peuvent être suivis par la détention ou par la revente des actions et cette décision devrait dépendre des informations privées sur le niveau de

la performance future de l'action (positive ou négative). Pour tester cette hypothèse il nous faut nous tourner vers l'utilisation qui est faite par les dirigeants des actions obtenues. La relation entre le comportement d'exercice et l'utilisation d'informations privées (positives ou négatives) devrait en effet dépendre de l'utilisation de ces actions obtenues (vente ou détention) et de la durée de vie restante des stock-options. Les exercices générés par des informations privées sur une performance positive de l'action dans le futur doivent être suivis par une détention des actions obtenues.

Pour réaliser ce test l'échantillon est divisé en deux sous-échantillons selon que les actions obtenues soient vendues durant les 5 jours suivants l'exercice ou non : 65.4 % des exercices sont suivis par la vente des actions. Cette vente intervient, le plus souvent, durant le jour même de l'exercice des stock-options. L'hypothèse testée stipule que les dirigeants exercent leurs options et vendent les actions obtenues lorsqu'ils attendent une faible performance dans le futur. Les résultats sur le premier sous-échantillon montrent une performance positive de 1.35 % à la suite de l'exercice des options et de la vente des actions obtenues, ce qui n'est pas cohérent avec l'utilisation des informations privées.

Lorsque les actions sont gardées (second sous-échantillon), le résultat montre une augmentation significative des prix de l'ordre de 3.03 %, ce qui est cohérent avec l'utilisation des informations privées. Cependant la différence entre les performances des actions dans les deux cas n'est pas statistiquement significative.

Les dirigeants peuvent choisir d'exercer leurs stock-options entre la date de vesting, date à partir de laquelle les options peuvent être exercées, et la date d'expiration. L'hypothèse stipule que les exercices près de l'expiration sont entraînés par l'expiration. Les dirigeants doivent exercer ces options avant de les perdre. Les résultats montrent que 18,5 % des exercices de stock-options interviennent durant le dernier trimestre. Ces exercices interviennent après une baisse des prix sur le marché. Ces dirigeants n'ont probablement pas le temps de choisir le moment opportun pour exercer leurs stock-options. Ces exercices sont générés par l'expiration des options. Dès lors que le prix actuel dépasse le prix d'exercice des options, les dirigeants vont réaliser un profit en levant leurs stock-options. Les résultat de ce chapitre montre que l'exercice des options avant l'expiration intervient donc peu de temps après une importante augmentation des prix sur le marché (CAR[-20; -1] = 2,50 % lorsque les options sont exercées

loin de l'expiration versus − 0,22 % lorsqu'elles sont exercées près de l'expiration.

Comme le montre le résultat précédent, les exercices qui interviennent à expiration sont entraînés par l'expiration, afin de tester si les dirigeants utilisent leurs informations privées pour exercer leurs options et pour décider de détenir ou de vendre les actions, seuls les exercices qui sont les plus susceptibles d'être entraînés par des informations privées sont pris en compte (exercices éloignés de l'expiration).

En observant l'évolution du prix de l'action, il semblerait que les exercices d'options qui interviennent au moins trois mois avant l'expiration sont basés sur des informations privées quant à l'évolution future de la valeur de l'entreprise. En effet, sur le long terme le prix de l'action augmente significativement à la suite d'exercices d'options avec détention des actions obtenues (CAR[+1; +140] = 3,46 %) alors qu'aucune tendance n'émerge lorsque les actions obtenues sont revendues immédiatement (CAR[+1; +140] = 0,66 %). Les dirigeants exercent donc leurs options et gardent les actions lorsqu'ils s'attendent à une bonne performance de l'entreprise dans le futur et vendent les actions obtenues dans les autres cas. Ceci est cohérent avec une utilisation d'informations non publiques pour choisir : (i) le moment opportun pour exercer les stock-options et (ii) pour décider de détenir ou de vendre les actions obtenues. Ces résultats montrent que le comportement d'exercice des dirigeants est donc étroitement lié à l'utilisation d'informations privées. Sans la séparation des exercices selon la durée de vie restante rendue possible par la singularité de notre base de données, il aurait été impossible de distinguer les exercices motivés par l'expiration de ceux motivés par les informations privées.

Les résultats montrent aussi que exercices non suivis par la vente des actions interviennent après une légère hausse des prix comparé à la hausse des prix lorsque les actions sont vendues. Ce résultat est cohérent avec la motivation de minimiser la fiscalité des gains d'acquisition, ceux-ci étant fortement imposés. Les dirigeants qui disposent d'informations privées sur la performance futur ont tendance à exercer leurs options après une plus faible performance et à garder les actions obtenues afin de minimiser la fiscalité des gains d'exercice.

Les résultats de cette étude d'événement sont confirmés par une analyse multivariée. Ces résultats établissent par ailleurs que les dirigeants avec une double position (Président du Directoire et Directeur Général) ont moins tendance à utiliser leurs informations privées. Dans la littérature, la dualité est pourtant considérée comme un signe de faible gouvernance

d'entreprise : les dirigeants des entreprises souffrant d'une faible gouvernance sont en effet plus susceptibles que les autres de se comporter de manière plus opportuniste afin d'augmenter leur bénéfice privé. À moins que ces dirigeants soient les actionnaires principaux ou les fondateurs, ce qui serait cohérent avec le fait que les dirigeants dans les entreprises avec une plus forte gouvernance sont moins susceptibles d'utiliser leurs informations privées pour augmenter leur propre bénéfice. Ginglinger and Hamon (2011) examine les structures de propriété de 1550 entreprises françaises. Ils constatent qu'en France 70,1 % sont des entreprises familiales. Dans l'échantillon final de notre étude, il n'y a que de grandes entreprises cotées en bourse qui sont moins susceptibles d'avoir des actionnariats familiaux. Si les dirigeants de ces entreprises sont membres de la famille propriétaire, ils peuvent alors agir dans le meilleur intérêt des actionnaires, ce qui pourrait expliquer la moindre utilisation des informations privées pour exercer les stock-options. Il serait intéressant d'aborder la relation entre le comportement de l'exercice et la gouvernance d'entreprise dans la recherche future.

Pour finir, ce chapitre étudie dans quelle mesure le prix de l'action le jour de l'exercice déclaré à l'AMF est favorable aux dirigeants, comparé aux prix durant les 5 jours où les exercices doivent être déclarés. Ce test permet de vérifier si les dirigeants ne déclarent pas une date où le prix de l'action était plus élevé lorsqu'ils revendent les actions ou une date où le prix était plus bas lorsqu'ils détiennent les actions. Ces pratiques ont un effet sur la fiscalité des gains obtenus lors de l'exercice des stock-options. En déclarant une date avec un prix plus bas, le gain d'acquisition est réduit ce qui réduit la fiscalité sur ce gain qui est fortement imposé.

Le résultat montre que 25,68 % des exercices suivis de la revente des actions coïncident avec le prix maximum durant ces 5 jours, ce qui fournit une preuve supplémentaire de l'utilisation des informations. Ce résultat pourrait être interprété comme du Backdating, c'est à dire le fait d'antidater les exercices. Cependant les dirigeants n'ont pas intérêts à déclarer un prix supérieur à celui de l'exercice effectif car cela fera augmenter l'impôt sur le gain d'acquisition. D'autant plus que lorsque les actions sont vendues sur le marché, il est peu probable de trouver un investisseur acceptant de payer un prix supérieur à celui du marché. Ce résultat est cohérent avec celui de Cicero (2009), qui a trouvé que les dirigeants avaient moins tendance à antidater leurs exercices lorsqu'ils revendent les actions sur le marché.

Quand les exercices sont suivis par une détention des actions, le résultat montre que 33,69

% des exercices coïncident avec le prix minimum durant les 5 jours suivants la date déclarée à l'AMF. Ce résultat peut être interprété comme du Backdating. Les dirigeants peuvent en effet choisir de déclarer une date d'exercice où le prix de l'action était plus bas lorsqu'ils ne revendent pas les actions obtenues leur permettant ainsi une baisse du montant des impôts à payer. En cas de bonne performance dans le futur, le gain de vente va augmenter. De plus, en France, lorsque les actions obtenues sont détenues pendant au moins deux ans, les dirigeants peuvent bénéficier d'un abattement de 50 % sur le montant du gain de vente (plus-value de vente). Cette pratique n'est pas illégale tant que le conseil d'administration et les actionnaires l'autorisent, ce qui est néanmoins peu probable. Antidater des exercices d'options qui ne sont pas suivis par la vente des actions est possible mais pour le moins risqué. En effet les entreprises qui autorisent cette pratique pourraient devoir licencier leurs dirigeants et risquer des poursuites judiciaires En résumé les résultats de ce chapitre montrent que certains dirigeants utilisent leurs informations privées pour exercer leurs options loin de l'expiration et que d'autres antidatent les exercices des options non-suivis par la vente des actions. Les performances des actions autour de la date d'exercice suggèrent donc que les prix sont manipulés par les dirigeants. Les résultats de ce chapitre soulèvent plusieurs questions. Quelle est l'origine des mouvements de prix des actions autour de l'exercice des stock-options ? Ces performances sont-elles liées à la divulgation volontaire ou obligatoire d'information autour de l'exercice des options ? Les dirigeants divulguent-ils plus de bonnes nouvelles avant d'exercer leurs options ?

Chapitre 3 : CEO Stock Option Exercises and Earnings Announcements

Le troisième chapitre de la thèse appréhende l'origine des mouvements des cours de l'action autour de l'exercice des stock-options qui ont été observés dans le deuxième chapitre de la thèse. Ce chapitre examine donc la capacité des dirigeants à modifier le timing et le contenu des annonces de résultats annuels.

Cette étude est par essence liée à la littérature sur la divulgation d'informations. Les dirigeants peuvent en effet choisir de se faire attribuer leurs stock-options peu de temps avant ou après les annonces de résultats (Yermack (1997)) ; ils peuvent aussi divulguer volontairement des informations autour des attribution et/ou des exercices de stock-options (Aboody and

Kasznick (2000), Chauvin and Shenoy (2001), Brockman et al. (2010)). Les dirigeants ont aussi la capacité de retarder la divulgation des bonnes nouvelles et d'accélérer la divulgation des mauvaises nouvelles. Avec cette dernière stratégie, les dirigeants diminuent le prix des actions avant l'attribution des stock-options en vue de recevoir des options avec un faible prix d'exercice. Enfin d'autres dirigeants utilisent un montant plus élevé dans les comptes de régularisation (Accruals) lorsque leurs gains sont élevés (Bergstresser and Philippon (2006), Hribar and Collins (2002), Gopalan et al. (2014)).

Les dirigeants peuvent choisir d'exercer leurs options peu de temps avant ou après les annonces de résultats en fonction de la qualité des résultats (surprise positive ou négative). Grâce aux données détaillées, nous pouvons distinguer l'hypothèse de la manipulation et celle du bon timing des exercices des stock-options. En effet, la capacité de timing des exercices d'options qui sont proches de leurs dates d'expiration est réduite, les dirigeants n'ont d'autre choix que de les exercer rapidement. Les dirigeants pourraient alors être tentés d'augmenter les résultats pour maximiser le gain d'exercice. Les exercices d'options qui se produisent à expiration et à la suite d'annonces de résultats sont considérés comme exogènes car les dates d'expiration des options ne sont pas sous le contrôle des dirigeants : ces dates sont en effet fixées le jour de l'attribution.

Cette recherche enrichit la littérature existante par l'étude de la manipulation des résultats et de leurs annonces lorsque les dirigeants doivent exercer leurs stock-options. Afin de tester le lien entre les exercices des stock-options des dirigeants et les différentes façons possibles de manipuler le contenu et le timing des annonces de résultats, trois tests sont menés. Un premier test sur le niveau de surprise dans les divulgations obligatoires (à savoir les annonces des résultats annuels) lorsque les dirigeants doivent exercer leurs stock-options d'achat proches de l'expiration est mené. Ce premier test permet aussi de mesurer l'importance des bonnes nouvelles dans les annonces de résultats en fonction de l'utilisation d'actions (vente ou détention) obtenues suite à l'exercice des stock-options proches de l'expiration est mesurée. Ensuite, le timing (calendrier) des annonces de résultats est examiné. Enfin, l'hypothèse de la manipulation des résultats en utilisant plus d'Accruals lorsque les dirigeants doivent exercer leurs stock-options à proximité de la date d'expiration est testée.

Les données détaillées sur les exercices des dirigeants des entreprises françaises constituant

l'indice SBF 120 entre 2007 et 2014 ont été collectées depuis les documents de référence des entreprises. Sur les 540 exercices effectués par 71 dirigeants dans 67 entreprises, 65,4 % des exercices sont suivis par la revente des actions afin de répondre à des besoins potentiels de liquidité et 18,5 % des exercices de stock-options se produisent au cours du dernier trimestre. Pour compléter notre analyse des données sur les annonces annuelles de bénéfices et sur les consensus des analystes sont collectées. Parmi les 540 exercices, 98 interviennent durant les 30 jours qui suivent l'annonce des résultats annuels. 33 % de ces exercices se produisent à proximité de l'expiration. Afin de distinguer les surprises positives des surprises négatives, le bénéfice par action divulgué par les entreprises a été comparé au consensus des analystes.

L'hypothèse de manipulation des résultats annuels, qui stipule que les dirigeants vont augmenter les résultats afin de dépasser les prévisions des analystes, est testée en mesurant la probabilité d'avoir de bonnes nouvelles (surprise positive) dans les cas où les dirigeants ont effectivement exercé leurs options à expiration quelques jours après l'annonce des résultats annuels. Cette probabilité devrait être plus importante lorsque les options sont exercées à proximité de leurs dates d'expiration et lorsque les actions obtenues sont vendues.

Conformément à cette première hypothèse, les résultats montrent que la probabilité d'annonce de résultats supérieurs au consensus des analystes est de 19,6 % plus élevé lorsque les options sont exercées à expiration ; la probabilité de surprise positive augmente de 33,5 % lorsque les dirigeants exercent leurs options à expiration et vendent les actions obtenues. Ces résultats montrent la capacité des dirigeants à augmenter les résultats de leurs entreprises quand ils ne disposent plus d'assez de temps pour exercer leurs stock-options et revendent les actions obtenues pour satisfaire des besoins de liquidités ou de diversification de leurs portefeuilles. Une faible probabilité de surprise positive est trouvée lorsque les dirigeants avec double position (PDG) exercent leurs options à expiration, ce qui pourrait être dû à leurs préoccupations vis-à-vis de leur réputation. Les résultats de ce chapitre sont en accord avec la manipulation des résultats par des dirigeants qui doivent exercer des stock-options peu avant leur date d'expiration. Les résultats de ce chapitre sont aussi en accord avec ceux de Brockman et al. (2010) qui trouve que les dirigeants ont tendance à annoncer volontairement plus de bonnes nouvelles avant d'exercer leurs options.

Concernent les calendriers des annonces de résultats, ceux-ci sont fixés ex-ante puisque

les entreprises doivent annoncer leurs résultats pratiquement le même jour chaque année. Par ailleurs les dirigeants ne sont pas autorisés à effectuer des transactions durant la période qui précède l'annonce des résultats. Cependant lorsque les stock-options expirent quelque temps après l'annonce des résultats, les dirigeants peuvent être tentés d'accélérer l'annonce afin d'éviter de perdre leurs stock-options, et ce notamment si les annonces sont positives pour le dirigeant. La deuxième hypothèse sur la relation entre le calendrier des annonces des résultats annuels et l'exercice des stock-options peu avant l'expiration est testée.

Les résultats obtenus témoignent d'une différence dans le calendrier des annonces de résultats au cours de l'année où les dirigeants exercent leurs options proches de l'expiration peu après les annonces de résultats annuels. On observe une période entre la fin de l'exercice fiscal et les annonces qui est dépendante de la différence entre les revenus réels et les prévisions des analystes. Les entreprises accélèrent les annonces de résultats lorsque les dirigeants exercent leurs options à proximité de l'expiration et peu de temps après l'annonce de résultats supérieurs aux prévisions des analystes, en particulier lorsque les actions obtenues sont revendues. Les résultats montrent également que les dirigeants avec une double position (PDG) ne changent pas le calendrier des annonces de résultats lorsqu'ils exercent leurs options à expiration. Ceux-ci pourraient être plus préoccupés par leur réputation que les autres, les empêchant ainsi de se comporter de façon opportuniste. Ces dirigeants pourraient être les fondateurs de la société ou les actionnaires principaux.

La troisième hypothèse du Chapitre 3 examine les potentielles manipulations des bénéfices en utilisant un niveau plus élevé d'Accruals : pour tester cette hypothèse nous estimons les ajustements discrétionnaires (discretionary accruals) ; ajustements qui représentent la proportion des charges à payer qui peuvent être directement choisis par les dirigeants. Lorsque le dirigeant obtient un gain plus important lors de l'exercice de ses stock-options, on note un niveau plus élevé des ajustements discrétionnaires lors des annonces de résultats annuels. Ce résultat est cohérent avec la manipulation des résultats de Bergstresser and Philippon (2006) et de Gopalan et al. (2014).

Ce chapitre constitue un apport à la littérature sur la divulgation d'informations autour de l'exercice des stock-options en apportant des preuves sur le comportement opportuniste des dirigeants lorsqu'ils doivent exercer leurs stock-options à proximité des dates d'expirations.

Les trois chapitres de cette thèse se combinent pour offrir une meilleure compréhension du comportement des dirigeants autour de l'exercice des stock-options. Cette recherche contribue en effet à la littérature existante sur les exercices des stock-options en examinant le comportement des dirigeants lors de l'exercice de leurs stock-options en tenant compte de la durée de vie des options ainsi que de l'utilisation des actions obtenues. Les résultats de cette recherche fournissent des preuves de l'existence d'un comportement opportuniste des dirigeants. Les résultats sont cohérents avec le timing des exercices en lien avec leurs informations privées, le backdating de quelques exercices non suivis par la vente d'actions et la manipulation des résultats avant l'exercice des stock-options à proximité de leurs dates d'expiration.

Cette recherche intéresse donc directement les organismes de réglementation des marchés financiers, ainsi que pour les actionnaires. Le comportement opportuniste étant établi, le régulateur pourrait par exemple réduire la fenêtre de déclaration des transactions à deux jours de bourse comme aux États-Unis. Enfin, afin d'éviter la manipulation des résultats, il pourrait être intéressant d'empêcher les dirigeants d'exercer leurs options d'achat à la fois avant et après les annonces de résultats.

Les limites de cette recherche sont liées aux questions de gouvernance d'entreprise qui seront abordées dans les recherches futures. Il serait tout particulièrement intéressant d'étudier si la structure de gouvernance de l'entreprise a un impact sur le comportement d'exercice des dirigeants.

Les études existantes et la présente recherche montrent donc des comportements opportunistes des dirigeants. Cependant, la question la plus importante est de lier leur comportement avec le rendement des actions, en d'autres termes, comprendre si les dirigeants augmentent, à la fois la valeur des entreprises et leur propre richesse. Les recherches futures devraient étudier l'effet direct de la rémunération en options, ou plus généralement la rémunération à base d'actions, sur la performance des entreprises.

Introduction

Stock option compensation has become well known over the last decades not only because it is increasingly used, but also because of the scandals related to practices around stock option awards and exercises. [1] Companies grant employees with stock options that give them the right to buy their own companies' stocks at a lower stock price. The exercise price of stock options is fixed at the award date. Once options are granted; option recipients capture a portion of the value created for shareholders from any decision that increases the stock price.

Stock options are non-tradable options; their recipients cannot sell them. As long as the stock price at the exercise date is higher than the exercise price of options, the recipients will make a profit. Executives are the largest recipients of stock options, because, in Theory, stock options give incentives to increase firm value and so companies use them to mitigate agency problems between owners and managers (Haugen and Senbet (1981)). However, this type of compensation does not reduce agency problems (Yermack (1995), Sautner and Weber (2011)). CEOs may behave opportunistically in order to increase gains obtained from stock options. Stock option compensation may be used by some companies facing liquidity problems to use less cash compensation (Yermack (1995)).

CEOs receive a large proportion of annual compensation in the form of stock options. When stock prices increase sufficiently, CEOs obtain high gains from stock option exercises and from the sales of the obtained shares. Instead of giving incentives to increase shareholder wealth, stock option compensation provides CEOs incentives to serve their own interest. CEOs increase their stock option compensation by manipulating the awards and/or the exercises.

Stock option compensation rewards executives for maximizing the difference between the

[1] For example: option backdating at Apple and large exercises at EADS shortly before the announcement of delays in the construction of the Airbus A380.

exercise price of stock options and stock price at the exercise date. This type of compensation provides executives with incentives to reduce option exercise price at the award date as long as their behavior has no long term detrimental impact on stock price level. Stock option compensation also provides executives with incentives to increase stock price before exercising their stock options.

This dissertation examines CEO exercise behavior in the largest French companies over an eight year period. The aim of the dissertation is to investigate whether CEOs use their private information to time option exercises or manipulate earnings before exercising stock options, or whether CEOs manipulate the reported exercise date in order to increase their gains.

CEOs can exercise their stock options during an average of six-year period. They can exercise their stock options early in order to capture dividends. This strategy is optimal only if companies pay very large dividends (McDonald (2003)). CEOs may exercise their stock options in order to reduce their exposure to firm risks.

The dissertation contains three chapters. The first presents a description of stock option compensation and discusses the related literature; the second and the third chapters explore the exercise behavior of CEOs in the largest French Companies.

Chapter 1 presents a description of stock option compensation. It presents the processes of stock option awards and exercises and the gains option recipients obtain from stock option exercises. It also points out various tax regulations in France. This chapter discusses the existing literature on option awards and exercises for employees and executives. It focuses on the most related studies to this research. Chapter 1 sheds light on stock option compensation and its limits in mitigating agency problems bet.ween owners and managers.

From Chapter 1, I identify four opportunistic behaviors around stock option awards and exercises. First, CEOs may use their private information to time option exercises (or awards). Second, CEOs may manipulate the date they report to the Market Authority: they report a different date when the stock price was more favorable to them (i.e. report an award date in which the stock price was lower and an exercise date in which the stock price was lower when CEOs exercise the stock options and hold the shares). Third, CEOs may use voluntary or mandatory disclosures around stock option awards and exercises. CEOs can choose a time to release more good or more bad news voluntarily in order to move stock prices in one direction

or another. For mandatory disclosures, the timing is less flexible; however, this does not prevent CEOs from accelerating or delaying the announcements. Finally, CEOs may manipulate the contents of disclosures. They choose to release more good news or more bad news in order to make the stock prices move in the desired direction.

Using hand-collected data on CEO stock option exercises made between 2007 and 2014, chapters 2 and 3 examine CEO exercise behavior.

Chapter 2 investigates the exercise decisions of CEOs in the largest French companies. It tests whether stock option exercises are driven by expiry or by private information. The results indicate that CEO stock option exercises made far from expiry are driven by private information and those made close to expiry are driven by expiry. CEOs with time flexibility time their stock option exercises to occur after a stock price increase. They hold the obtained shares when they expect a positive abnormal performance in the long-run; this is consistent with the use of private information to time stock option exercises and decide whether to sell or to hold the shares.

Chapter 2 also examines how favorable the stock price is at the exercise date reported to the Market Authority (AMF) compared to the stock prices of the 5 trading days during which CEOs are required to report their transactions to the AMF. The results show that 25.68 % of exercises followed by stock sales occur at the maximum stock price and 33.69 % of exercises not followed by stock sales occur at the minimum stock price. These results are consistent with information timing of stock option exercises followed by stock sales and with backdating option exercises not followed by stock sales. This chapter sheds light on CEOs' ability to use private information to time their stock option exercises and on their ability to backdate some exercises.

Chapter 3 examines the relation between CEO stock option exercises and annual earnings announcements. I first examine whether CEOs manipulate earnings before exercising stock options close to expiry. I lmeasure the likelihood that earnings are higher than analyst forecasts (positive surprise). The results show a higher likelihood of releasing positive surprise before exercising stock options close to expiry (19.7 %). The likelihood of positive surprise increases by 33.5 % when CEOs sell the obtained shares. The results display a lower likelihood of positive surprise when CEOs with dual positions exercise their stock options close to expiry and sell the obtained shares; this could be due to reputation concerns of CEOs who may be founders or major shareholders.

The second part of Chapter 3 investigates CEOs' ability to change the timing of earnings announcements which are supposed to be announced in a scheduled manner. The results indicate that companies accelerate earnings announcements when CEOs have to exercise their stock options close to expiry especially when the obtained shares are sold and when the earnings meet or exceed analyst forecasts (i.e. positive surprise). The third part of this chapter presents a test for earnings manipulation using discretionary accruals. The results display a higher level of discretionary accruals when CEOs have to exercise options that are about to expire. Overall, Chapter 3 provides evidence of CEO ability to manipulate the timing and contents of earnings announcements.

The three chapters of this dissertation combine to provide a better understanding of executives' behavior around stock option exercises.

This research contributes to the existing literature on stock option exercises by investigating CEO exercise behavior conditioned on time to stock options expiry and use of obtained shares. The results of this research provide evidence about the existence of CEO opportunistic behavior. The results are consistent with information timing of stock option exercises, backdating of some exercises not followed by stock sales and earnings manipulation before exercising stock options close to their expiry dates.

This research could be interesting for regulators as well as for shareholders. It shows that CEOs can use private information to time stock option exercises and decide whether to sell or hold the obtained shares. The results provide evidence about CEOs' ability to time their stock option exercises to occur in the most favorable time, especially when they hold the obtained shares. The reporting window could be reduced to 2 trading days as in the U.S. Finally, this research shows that CEOs may be tempted to manipulate earnings upwards in order to meet or to exceed analyst forecasts before exercising stock options that are about to expire. In order to prevent earnings manipulation, it could be worthwhile to prevent CEOs from exercising their stock options both before and after earnings announcements.

The limits of this research are related to corporate governance issues which will be addressed in future research. It would be interesting to investigate in more detail whether company governance structure has an impact on CEO exercise behavior.

Chapter 1

Stock Option Awards and Exercises: A Survey

ABSTRACT

This chapter presents a description of stock option compensation such as awards, exercises, gains obtained from stock options and taxes, etc. The chapter discusses the existing literature on stock option awards and exercises and highlights research questions that could be addressed in future research. It identifies four opportunistic behavior of CEOs around stock option awards and exercises. To increase their stock option compensation, CEOs can either use private information, backdate option awards and/or exercises, change the timing of voluntary/mandatory disclosures, or manipulate announcements.

RÉSUMÉ

Ce chapitre présente les caractéristiques des stock-options, tels que les attributions, les levées des options, les gains obtenus ainsi que les impôts auxquels sont soumis les différents gains. Par ailleurs ce chapitre synthétise la revue de la littérature sur les attributions et les levées des stock-options et présente des questions de recherche qui pourraient être traitées dans le futur. Le chapitre met en lumière quatre comportements opportunistes des dirigeants. A fin d'augmenter leurs gains, les dirigeants peuvent soit utiliser leurs informations privées, antidater les attributions et/ou les levées des stock options, changer le timing des annonces volontaires ou obligatoires, ou manipuler les annonces.

1.1 Introduction

It is well known that agency problems exist between principal (shareholders) and agent (managers). Managers do not always act in the shareholders' best interests (Jensen and Meckling (1976)). Managers are supposed to act to maximize firms' value thereby maximizing shareholders' (owners') wealth, however, managers may have self-serving behavior. Companies may use several mechanisms to mitigate agency problems between owners and managers, such as: compensation, contractual conditions about firing managers who act opportunistically and other mechanisms. Companies choose to bind compensation to stock performance by using equity incentives and stock-based compensation. Managers receive stocks or options whose values are directly related to stock performance (Fama (1980), Jensen and Murphy (1990), Haugen and Senbet (1981), Core and Guay (1999)). Stock option compensation can be used to solve the agency problems between owners and managers. To incentivise CEOs and prevent short-termism behavior, companies might also deffer some variable compensation such as bonuses (Thanassoulis (2013)).

Yermack (1995) examines CEO stock option awards in a large sample of U.S. public companies. He tests whether stock option compensation is used to reduce agency cost. He finds that stock option compensation does not provide CEOs with incentives to increase shareholders' wealth and thus to reduce agency cost. He finds that firms use stock option compensation when earnings are noisy and when firms face liquidity problems.

In a more recent study, Sautner and Weber (2011) investigate the relation between corporate governance and the design of CEO stock option contracts in 81 large European firms. They find that firms with weak corporate governance grant their CEOs stock option plans with low performance conditions exhibiting CEOs power over their compensation committees to obtain favorable option grants. Sautner and Weber (2011) also find that these firms have lower future performance which is inconsistent with the fact that stock options are used to give CEOs incentives to work hard in order to increase shareholders' wealth.

Stock option compensation is used to give CEOs incentives to increase firms' value, however, it seems that CEOs increase their own profit. In this chapter, I present the stock option award and exercise processes and CEO behavior around stock option awards and exercises. The

chapter presents the most important studies related to stock option compensation and highlights potential research topics that could be addressed in the future. This chapter does not claim to provide an exhaustive literature review of stock option compensation. It focuses on the most related studies to this research.

The remainder of this chapter is organized as follows. Section 1.2 presents a description of stock option compensation. Section 1.3 discusses the existing literature on stock option awards and exercises and section 1.4 concludes.

1.2 General points about stock options

1.2.1 The stock option award process

Via their Compensation Committees [1], companies grant their executives and employees stock options, once a year (in most cases). Stock options give the right to buy companies' shares at a predetermined stock price called the *"Exercise Price"*. The exercise price of the stock options is the stock price at the award date, or in some companies the exercise price is computed as the average stock price a few days before the award date. Choosing the average stock price in the pre-award period as the exercise price of the stock options is used as a way of preventing manipulation of stock price downwards before the stock option awards.

At the award date, the Compensation Committee fix several rules: a) the number of stock options awarded to executives and employees; b) the exercise price of options; c) the period of validity of these stock options. In France the period of validity is a maximum of 10 years as from the award date; d) the vesting date, in other words the date from which the options can be exercised. On average, stock option award beneficiaries have to wait four years before starting to exercise their stock options; e) the expiry date of the stock options, i.e. the date from which the option holders lose the non-exercised stock options.

In some companies, the stock option award beneficiaries have to be present in the company at the stock option exercise date.

Executive stock option awards could be subject to performance conditions. When executives

[1] Some companies do not have Compensation Committees, boards of directors are in charge of the awards.

do not meet the fixed performance conditions, they lose their stock options. Some companies grant their executives stock options that vest by installments (progressively) on different dates, under performance conditions. In such cases, executives can exercise a certain number of options when they meet their performance conditions, as stated in the option plan.

Stock option awards can either be scheduled or unscheduled. Option awards are considered as scheduled when the awards occur within two business days compared with the previous year, or on the same day every year. Companies may choose scheduled awards in order to prevent their executives from influencing their Compensation Committees to grant them stock options when the stock price is low.

Due to the increased use of stock option compensation and the importance of this type of compensation relative to total compensation (Yermack (1995), Chapter 2 of the Thesis), government and financial authorities such as the SEC (Securities and Exchange Commission) in the U.S. and the AMF (Autorité des Marchés Financiers) in France became interested in stock option compensation. These authorities fixed a legal framework to protect shareholders' interests and required companies to disclose the details of their executives' compensation. Thanks to the authorities' requirements, empirical studies have been carried out on executive compensation.

In 2013, the French AFEP-MEDEF corporate governance code introduced the "Say on Pay" which gives the right to shareholders to vote on managerial compensation. This practice may not be an effective way to reduce executives compensation, since shareholders are more interested in checking the relation between pay and firms' performance. For a literature review (in French) on "Say on Pay", see Belot and Ginglinger (2013).

1.2.2 The stock option exercise process

Option holders can exercise their stock options after the vesting periods (four years after the award date) as long as the stock price is higher than the exercise price of the options. When option holders decide to exercise their stock options, they buy shares at the predetermined price. After exercising stock options, if there are no shareholding requirements[2], employees and

[2] Companies can require option holders to hold the shares during a period of time (two years in general).

executives can choose to hold or sell the obtained shares. The decision to hold/sell the obtained shares may depend on the existence of private information, tax motivations, or diversification and liquidity needs. Options holders may also decide to sell the shares in order to lower their exposure to their companies' risk.

The stock option exercises can be considered as cashless exercises when the brokerage firm pays for the stock option exercise before being reimbursed when the shares are sold (immediately after the stock option exercises).

The board of directors implement periods surrounding earnings announcements, i.e. *"blackout periods"*, during which executives are not allowed to trade on their own companies. The periods usually begin 21 days before the disclosures and end 3 days afterward. Executives can choose to exercise their stock options outside these periods.

Once the stock options are exercised, option holders become shareholders, they can profit from dividend payments, obtain voting rights and have to pay tax on business capital (wealth).

After exercising the stock options, executives are required to report their transactions to the AMF (French Market Authority) within five trading days by filling in a form via a secured Extranet called "ONDE". In the declaration form (see Appendix), executives should mention their names and positions, the type of security used in the operation (stocks or other securities) and the nature of the transaction (for example: stock option exercise, stock sale, stock purchase, ...). Executives have to report the transaction date and the place of the operation; transactions could occur in the market or outside the market, when transactions occur in the market, executives should add the stock market name. On the declaration form, executives indicate the unit price of the security and the whole amount of the operation. They can also add complementary information if needed. When stock option exercises are followed by stock sales, executives have to report the stock sales by completing another form on the Extranet.

1.2.3 Exercise price adjustments

The Compensation Committee fixes the exercise price of stock options at the award date, however, this price could be adjusted to take into account certain operations defined by Law L.225-181 of the "Commercial Code" to protect option holder interests. The exercise price

of existing stock option plans should be adjusted in the following situations: a) stock split or reverse split; b) depreciation or reduction of capital (e.g. share repurchase); c) changes in payout policy; d) share grants or distribution of reserves or any equity or issue of security that gives share allocation subscription rights restricted to shareholders; e) incorporation of reserves, of profits or share premiums.

By adjusting the exercise price of the awarded stock options, companies also adjust the number of options awarded such that option holders are not affected by corporate actions.

In France option repricing, or exercise price adjustment, is subject to a legal framework which is not the case in the U.S. where companies may reprice the stock options awarded to their executives or employees when the options are out of the money. Companies fix another exercise price for stock option awarded few time ago. This option repricing works against the idea that stock options are granted to make executives work hard to increase firms' value and thereby mitigate the agency problems. However, Acharya et al. (2000) explain that it is optimal to reprice existing options following bad stock performance since this will give incentives to employees and executives to stay in the firm and work in order to increase firms' value. In line with this, Sauer and Sautner (2008) find that firms' performance improves following option repricing in Europe.

1.2.4 Gains from stock options

Option holders obtain two types of gains at different dates. At the exercise date, they obtain an acquisition gain equal to the difference between the stock price at the exercise date and the exercise price of the stock options. Once the stock options are exercised, option holders become shareholders; they can either sell the obtained shares during the exercise day or hold the shares for a while before selling them. At the sale date of shares obtained from stock option exercises, there is a capital gain from sales that is calculated as the difference between the stock price at the sale date and the stock price at the exercise date.

Figure 1.1 illustrates the different gains option holders obtain at different dates. The stock price evolution of Figure 1.1 is based on one large French company that belongs to the SBF120 Index.

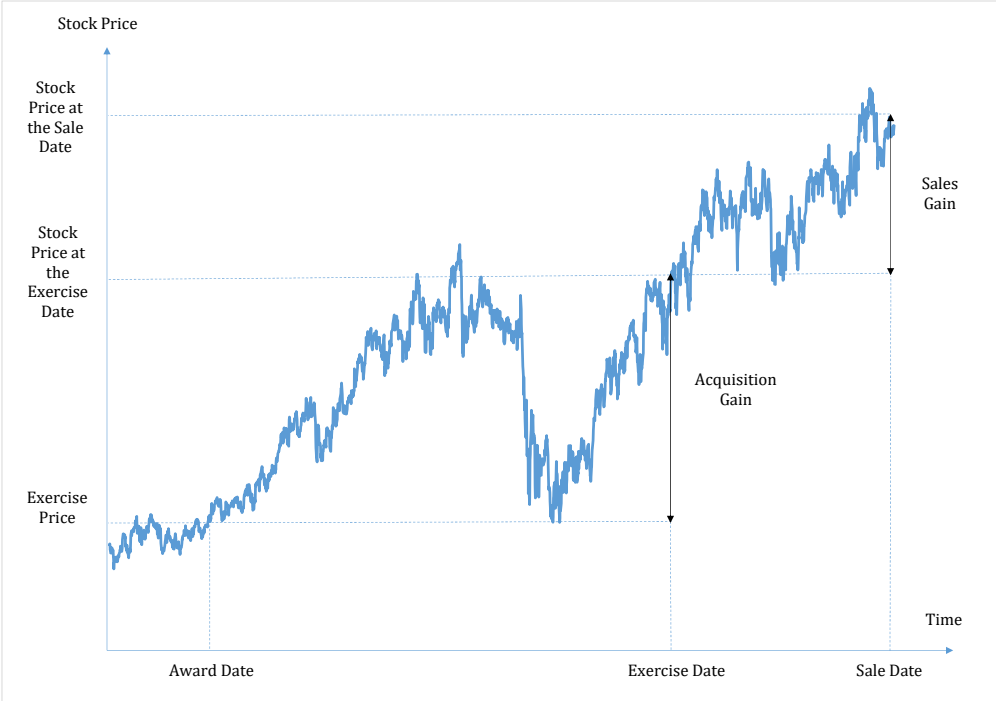

Figure 1.1 – Gains from stock option exercises and stock sales.

1.2.5 Taxes

Option holders pay taxes on both acquisition and sales gains. The taxes on acquisition gain are fixed at the stock option exercise time, however payment is made only at stock sale time. So, when shares obtained from stock option exercises are sold, the beneficiaries of the options pay taxes on both acquisition and sales gains.

In France, option holders have to wait four years from the award date before selling shares obtained from stock option plans awarded between April 27, 2000 and September 28, 2012 (five years for options granted before April 27, 2000) if they want to enjoy a more favorable tax regime. This period of four (or five) years is called the *"Tax Unavailability Period"* which should be distinguished from the time between the award date and the vesting date that most companies define; during this time, option holders cannot exercise their stock options.

Employees or executives who do not sell shares obtained from exercises of options awarded before September 28, 2012 during the first four (five) years pay less in tax, they can choose to pay taxes using a specific tax rate or pay income taxes using gradual income tax rates.

Otherwise, the acquisition gain is added to salaries, which are subject to social security contributions and taxed at the gradual income tax rates. This favorable tax regime is no longer applicable to option plans awarded after September 28, 2012. Stock option holders can benefit from a tax rebate if the obtained shares are held for at least two years from the tax unavailability period or from the exercise date if the stock options are exercised after this unavailability period.

The tax rules depend on the award date, on the use of the obtained shares, on the period of stock holding and on whether option holders respect the tax unavailability period. [3]

a. Option awards that occur between September 20, 1995 and April 27, 2000:

For these stock option plans, the tax unavailability period is five years, so option holders should not sell the obtained shares during the first five years to enjoy a favorable tax regime. When option holders exercise their stock options and sell the shares after the period of tax unavailability, the acquisition gain is either taxed as salaries at gradual income tax rates or at a tax rate of 30 %. The sales gain is taxed as a capital gain on security sales at the gradual income tax rates. Option holders who exercise stock options and hold shares for at least two years can obtain a 50 % tax rebate on the sales gain and 65 % if they hold the shares for over eight years.

b. Option awards that occur between April 27, 2000 and September 28, 2012:

The acquisition gain is divided into two parts. The annual amount below 152,500 € is taxed at 18 % when the obtained shares have been held for at least two years and 30 % otherwise. The remaining amount is taxed at 30 % if the shares have been held for at least two years and 41 % if they are sold before the two-year shareholding period. Option holders can also choose to pay taxes on the acquisition gain based on the gradual income tax rates as salaries and wages. From October 16, 2007, option holders have to pay 10 % as an employee contribution in addition to the acquisition gain taxes. Sales gain is taxed as capital gain on security sales at gradual income tax rates; this is less taxed when the shares have been held for at least two years. The tax rebate depends on the shareholding period and is the same as that mentioned above.

[3] I thank the tax administration and a Wealth Management Advisor at *Société Générale Bank* for providing information about the different tax rules in France.

c. Option awards that occur after September 28, 2012:

There are no longer specific tax rates for acquisition gain. Both acquisition and sales gains are taxed at the gradual rates of income taxes. Acquisition gain is taxed as salaries and sales gain is taxed as a capital gain on security sales. Option holders obtain a tax rebate if the obtained shares have been held for at least two years. In addition to taxes, option holders have to pay 8 % employee contribution on acquisition gains.

Regardless of the award date of stock options, option holders have to pay social contributions on both acquisition and sales gains.

When the exercise price is lower than 95 % of the reference price at the award date (stock price at the award date or the average stock price during the 20 days preceding the awards), what is known as *"Excess Rebate"* occurs: this is a discount granted to option holders. The amount of discount over 5 % is subject to income tax and social security contributions at the exercise date of the stock options.

The tax regulations have changed over time. Gains from stock options granted after September 28, 2012 are subject to gradual income tax rates. There is no longer a favorable tax regime for acquisition gains. There is still a tax rebate on sales gains if the shareholding period is over two years. However, the stock option plans affected by the new tax regulations should vest in 2016, so data on their exercises is not yet available. It would be interesting to examine the impact (if any) of the changes in tax regulations on CEO exercise behavior in future research. The tax regulations could give CEOs more incentives to sell the obtained shares since there is no tax rebate on the acquisition gain. Nevertheless, with the tax rebate on the sales gain, CEOs may exercise their stock options and hold the shares for at least two years. This question provides a good research topic and should be addressed when the data becomes available.

In the U.S. even if the exercise gain (taxed as ordinary income) is taxed more than the capital gain from sales, McDonald (2003) demonstrates that it is not always optimal, from a tax perspective, to exercise stock options early and hold shares unless firms pay large dividends. Aboody et al. (2008) find results supporting the prediction of McDonald's model that holding non-exercised options is more optimal than holding shares. However, holding shares could provide tax advantages since the total gain from stock options is taxed at a capital gain tax rate,

which is lower than the ordinary income tax rate. CEOs who decide to (or are obliged) hold their shares believe that they will save taxes when they exercise their stock options and hold the shares based on private good news.

1.3 Existing literature

In this section, I start by presenting the existing literature around stock option awards, then I discuss the literature around stock option exercises.

1.3.1 Stock option awards

Several research papers examine executive behavior around stock option awards; these studies find that executives receive their stock options shortly before a stock price increase or after a stock price drop. While some studies attribute the stock patterns around the award dates to the timing of stock option awards, or to the timing of news releases around stock option awards, other studies find that executives manipulate the reporting date of the award (backdating).

Stock option awards can be timed to occur shortly around mandatory and/or voluntary disclosures. Yermack (1997) tests for the timing of CEO stock option awards around quarterly earnings announcements (mandatory disclosures). He finds a negative abnormal return ($-$ 0.58 %) during the 20 days preceding stock option awards and a significantly positive abnormal return (2.2 %) during the 50 days following the awards. He attributes stock price movements around the awards to the timing of award dates for unscheduled option awards to occur before the release of good news (favorable earnings announcements). However, Yermack's hypothesis of an opportunistic timing of stock option awards can apply only to firms with unscheduled awards; it is not applicable to the many firms with scheduled awards (i.e. the majority) since the application of the SEC requirements (Sarbanes Oxley Act 2002) that obliges option grants to be made within two trading days regarding the previous year.

Aboody and Kasznick (2000) test for the timing of voluntary disclosures around CEO (scheduled) stock option awards. They observe the same price pattern around stock option awards as in Yermack (1997). They find that CEOs delay good news until after the scheduled

stock option awards and rush forward bad news. They provide evidence that the price pattern reflects the timing of voluntary disclosures around scheduled stock option awards, rather than an opportunistic timing of the awards.

The optimal timing of stock option awards is to occur before the stock price increase. Lie (2005) finds negative abnormal returns preceding stock option awards and positive abnormal returns following the awards for both scheduled and unscheduled stock option awards. He finds that abnormal returns around unscheduled awards increase over time. He attributes the stock pattern to the ex-post timing of stock option awards. CEOs choose a past date when the stock price was low, as the award date of their stock options. The results of Lie (2005) could be attributed to option award backdating or to CEOs' timing ability. To distinguish between option award backdating and other explanations of Lie (2005)' results, Heron and Lie (2007) exploit the change in SEC reporting requirements for option grants that occur in 2002 in which the SEC obliged option awards to be scheduled. Their study aims to explain the fact that stock returns are abnormally negative before executive option grants and abnormally positive afterward. Heron and Lie compare the stock patterns before and after the Sarbanes Oxley Act of 2002 (SOX), taking into consideration two types of option awards: scheduled and unscheduled. They find a weaker return pattern since the SOX Act. They attribute the return pattern to opportunistic timing of information disclosure for scheduled option awards and to opportunistic grant time (backdating) for unscheduled awards. They provide evidence that backdating is the major source of abnormal stock return patterns around unscheduled option awards; the new reporting requirements have greatly limited backdating but have not eliminated it.

Collins et al. (2005) study CEO stock option awards and explain how companies make their choice between scheduled and unscheduled awards. They test whether the type of stock option awards is related to CEO influence over Compensation Committees and boards, and the relative weight of stock options in CEOs' total compensation. They provide evidence about CEOs' ability to obtain favorable unscheduled option awards when their option compensation is high and when their influence over Compensation Committees is high. Collins et al. (2005) find that firms with less independent boards of directors grant their CEOs unscheduled option awards and allow for favorable timing of these awards (i.e. option awards before a stock price increase). Their results are in line with Sautner and Weber (2011) who find that firms suffering from weak

corporate governance grant their CEOs more favorable stock option plans.

Chauvin and Shenoy (2001) examine the stock price changes prior to scheduled stock option awards. They find a stock price decrease during the 10-day period preceding scheduled option awards which is attributed to the timing of news announcements. Chauvin and Shenoy (2001) find that executives are more likely to disclose bad news before option awards and delay the announcement of good news until after the awards. They explain that when the market expect good news and the managers delay the announcement of this news until the awards, the market will consider this delay as bad news, so the stock prices go down.

Fich et al. (2011) examine CEO stock option awards in target firms during private merger negotiations. They find that target firms usually use unscheduled option awards during the negotiation period, even after SOX, and that CEOs negotiate lower offers when they benefit from stock option awards. This study provide evidence about CEO ability to act in order to receive stock option at a lower stock price.

Overall, these studies identify several opportunistic behavior around stock option awards: timing of stock option awards when the award date is not fixed ex-ante, timing of information disclosures when stock option awards are unscheduled and backdating of stock option awards.

1.3.2 Stock option exercises

The existing literature on stock option exercises explains exercise behavior in different ways. Some studies find that stock option exercises are driven by diversification and liquidity needs, others provide evidence of the use of private information around stock option exercises and/or backdating, other studies find that CEOs may use information disclosures to increase the profitability of their stock option exercises.

When options vest, CEOs can start exercising their stock options until expiry. In contrast to valuation models which predict that risk averse option holders should exercise early in the money options, Carpenter (1998) finds that executives hold the options that are deep in the money for a long time, in order to capture a high amount of their potential value. [4]

In aggregate, CEOs time their stock option exercises to occur after a stock price increase

[4] See Hall and Murphy (2002) for a theoretical model on cost, value and sensitivity of executive stock options.

(see Carpenter and Remmers (2001), Cicero (2009)). This result could be due to a good timing of stock option exercises. Testing for the use of private information requires the examination of post-exercise abnormal performance.

Carpenter and Remmers (2001) study CEO stock option exercise behavior and test for the use of private information. Because of lack of detailed data, they implicitly assume that all obtained shares are sold immediately after the stock option exercise. Carpenter and Remmers (2001) expected a negative abnormal performance following stock option exercises and stock sales. They do not find negative performance and conclude that CEOs exercise their stock options when they need liquidity or when they need to diversify their portfolio.

In contrast to Carpenter and Remmers (2001), Aboody et al. (2008) control for the use of shares and provide evidence of use of private information when CEOs exercise their options.

Cicero (2009) examines CEO exercise behavior. He finds that CEOs may exercise their stock options and sell the obtained shares in the stock market, hold the shares or give them back to their own companies. Cicero (2009) finds a negative stock performance following option exercises associated with stock sales and a positive abnormal performance following stock option exercises not associated with stock sales. The stock patterns are consistent with the use of private information around stock option exercises.

Cicero (2009) also provides evidence about the manipulation of the reported stock option exercise date (i.e. backdating). He tests for stock option exercises before and after the Sarbanes Oxley Act of 2002 (SOX) in which the SEC obliged CEOs to report their transactions within two trading days (CEOs had up to the 10th day of the following month to report their transactions). He compares stock returns in the pre-SOX and post-SOX periods distinguishing between exercises associated with stock sales and others. In the pre-SOX period, Cicero (2009) finds no abnormal returns shortly after option exercises associated with stock sales, which is inconsistent with backdating; and negative abnormal returns in the following months which is consistent with the use of private information. In the post-SOX period, he finds low negative abnormal returns shortly after option exercises and stock sales, which is consistent with backdating and market reaction to stock sales.

Cicero (2009) finds negative returns preceding option exercises not associated with stock sales in the pre-SOX period but not in the post-SOX period. He also finds positive and

higher stock returns following exercises not associated with stock sales in the pre-SOX period compared to the post-SOX period.

He concludes that the stock patterns are consistent with timing of option exercises based on private information in the pre- and post-SOX periods with a higher opportunity of timing based on private information in the pre-SOX period. Stock patterns in the pre-SOX period are also consistent with backdating of exercises not associated with stock sales.

As a further test for backdating, Cicero (2009) examines how favorable the stock price is at the exercise date relative to stock prices on days surrounding the exercise date. He finds that exercises not followed by stock sales were more likely to occur on the most favorable day of the month in the pre-SOX period.

He concludes that some stock option exercises were backdated before SOX when the obtained shares are held or given back to the companies, since it is unlikely to find a counterpart willing to pay a higher stock price than the market price. He provides evidence of the use of private information to time stock option exercises and evidence of backdating option exercises not followed by stock sales before SOX.

Cai (2007) investigates exercise backdating intensity before and after SOX (2002). He provides evidence of exercise backdating. He finds different backdating incentives regarding whether CEOs sell, hold or return back the obtained shares to the companies. He concludes that before SOX option exercises were backdated. Dhaliwal et al. (2009) find results, driven by tax motivations, consistent with backdating option exercises when the obtained shares are held.

Chapter 2 tests for CEO use of private information to decide when to exercise stock options and whether to sell or to hold the obtained shares. I find that stock options exercised close to their expiry dates are driven by expiry and not by private information. The stock performance in the post-exercise period is not significantly different when CEOs exercise their stock options close to expiry and sell or hold the shares. When stock options exercises occur far from expiry, results show that CEOs sell the shares when they expect a low stock performance in the future and hold the shares when they expect a positive stock performance in the future. I examine how favorable the stock price is at the reported exercise date relative to the 5 trading days following the exercises in which CEOs are supposed to report their transactions to the AMF. The result shows that 25.68 % exercises followed by stock sales occur at the maximum stock price. This

result provides a further evidence about information timing of option exercises followed by stock sales. 33.69 % of exercises not followed by stock sales occur at the minimum stock price. CEOs report an exercise date in which the stock price was the lowest relative to the 5 trading days following the exercises. These exercises could be backdated.

The results of Chapter 2 are consistent with information timing of stock option exercises associated with stock sales and with both information timing and backdating of option exercises not followed with stock sales.

Sautner and Weber (2009) examine the stock option exercise behavior of senior top managers in one of the largest German companies using a unique case study data. They combine individual-level data on stock option exercises with survey data obtained via questionnaires, allowing them to measure managers' characteristics. Sautner and Weber (2009) find that top managers exercise their options early and most of them do not hold the obtained shares. They find different exercise behavior due to different estimations of expected volatilities. Managers who expect lower stock price volatilities, both for companies' stocks and for the market, undervalue their stock options and choose to exercise their stock options earlier. They find that managers do not account for taxes when they exercise their stock options. This behavior might be due to specific tax rules in Germany and also to the fact that managers choose to sell the shares when they expect lower stock price volatility in the future, indicating that the most important incentive for them is to obtain a high gain from stock option exercises. They also find that top managers' exercise behavior is related to expected volatilities and not to risk aversion, diversification and liquidity needs, wealth or private information. Sautner and Weber (2009) show the existence of a relation between top managers' expectations and their exercise behavior which is different from their behavior relative to private information. On the contrary, Chapter 2 provides evidence of the use of private information when CEOs exercise their stock options far from expiry.

Stock-price based compensation such as stock options provides CEOs with incentives to disclose more information to the stock market; this mitigates agency problems between firms and investors (Nagara et al. (2003)). CEOs may choose a disclosure strategy around stock option exercises in order to increase their gains. Brockman et al. (2010) find that CEOs use their voluntary disclosures around stock option exercises in order to increase their exercise gain.

CEOs are more likely to voluntarily disclose more good (bad) news before exercising stock options and selling (holding) the shares. Brockman et al. (2010) provide evidence of CEOs' ability to manipulate their voluntary disclosures when they intend to exercise their options.

Unlike voluntary disclosures, CEOs cannot choose the timing of mandatory disclosures. However, Chapter 3 finds that CEOs accelerate earnings announcements before exercising stock options. The acceleration of the announcements is stronger when earnings exceed analyst forecasts and when CEOs have to exercise options that are about to expire.

CEOs may engage in earnings manipulation when they have to exercise their stock options. CEOs are more likely to release positive earnings surprise shortly before exercising stock options. When CEOs have to exercise their stock options close to expiry, the exercise decision is no longer a choice. To obtain a high gain from these exercises, CEOs may be tempted to release more good news in order to boost stock prices. Consistent with this, Chapter 3 finds a higher likelihood of positive announcements when options are exercised close to expiry. Earnings manipulation might be more severe in companies suffering from weak corporate governance. Companies with dual CEOs are viewed as companies with weak governance; inconsistent with this general idea Chapter 3 finds that the probability of positive surprise decreases by 73.4 % when dual CEOs exercise options close to expiry. Founders or major shareholders can hide behind these CEOs.

CEOs use a higher level of accruals to boost earnings before exercising stock options especially when they have high incentives (Bergstresser and Philippon (2006)). Results of Chapter 3 indicate that CEOs use a higher level of discretionary accruals when the gain from exercises made close to expiry is high. Bartov and Mohanram (2004) find that earnings manipulation is limited to large stock option exercises (exercises of more than 10,000 options). Chapter 3 shows that CEOs are able to manipulate both the timing and the content of voluntary and mandatory disclosures.

Few papers study stock option compensation for employees. For example, Core and Guay (2001) examine non-executive stock option plans. They present evidence that firms use stock option compensation for non-executives to give them incentives and also as an alternative to cash compensation when firms have financial constraints. Bettis et al. (2005) study employees' exercise behavior and find different exercise behavior related to firm and

employee characteristics. They find that risk-averse employees exercise their stock options early when the stock volatility is high. Huddart and Lang (1996) study the exercise behavior of 50,000 employees in eight U.S. corporations and find that option exercises occur shortly after the vesting dates and following a stock price increase. Huddart and Lang (2003) examine the exercise decisions of employees at different levels and provide evidence of the existence of private information on stock price levels by junior and senior employees.

1.4 Conclusion

In this chapter, I present the most important findings on stock option compensation. Companies use stock option compensation as a way to align managerial interests with those of shareholders. Companies give CEOs incentives to increase the firms' value.

The existing studies on stock option awards and exercises and this dissertation shed the light on the pervasive effect of stock option compensation. CEOs may act opportunistically around stock option awards and exercises in order to maximize their private profit. CEOs can use their private information to time their stock option awards and exercises, they may also time mandatory and voluntary disclosures to increase the gain they obtain from stock options. CEOs time their information disclosures to occur shortly before or shortly after stock option awards or exercises in order to move the stock price in the desired direction.

To increase stock option compensation, CEOs may engage in earnings manipulation when they have high incentives. Earnings manipulation is stronger when the options are close to their expiry dates. A natural question here is: does monitoring exist in these companies? Previous studies find mixed results about the role of corporate governance and CEO behavior. This issue should be addressed in the future to clarify the relation between corporate governance structure and executives behavior around stock option awards and exercises.

The existing studies show CEO opportunistic behavior around stock option awards and exercises. However, the most important issue is to link their behavior with stock performance, in other words, to understand whether CEOs increase the firm value and at the same time increase their own wealth. Future research should investigate the direct effect of stock option compensation, or stock based compensation in general, on firm performance.

1.5 Appendix

ISIN Code of the company

Date

INFORMATION

Déclaration individuelle relative aux opérations des personnes mentionnées à l'article L.621-18-2 du Code monétaire et financier sur les titres de la société

LA PRESENTE DECLARATION N'A PAS FAIT L'OBJET D'UN CONTROLE DE L'AMF ET EST ETABLIE SOUS LA RESPONSABILITE EXCLUSIVE DU DECLARANT.

Company's name

DECLARANT :	Name and Position
INSTRUMENT FINANCIER :	Type of Security
NATURE DE L'OPÉRATION :	Nature of the transaction or the operation
DATE DE L'OPÉRATION :	Date of the operation
DATE DE RECEPTION DE LA DECLARATION :	Declaration date
LIEU DE L'OPÉRATION :	Place of the operation
PRIX UNITAIRE :	Price per security
MONTANT DE L'OPÉRATION :	Total amount of the operation
INFORMATIONS COMPLEMENTAIRES :	Complementary information

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Chapter 2

Executive Stock Option Exercises and CEO Private Information

ABSTRACT

This chapter tests whether CEO's exercise decision is driven by option expiry or by private information. I examine CEO stock option exercises with respect to the use of the underlying shares (i.e. sale or holding) and with respect to the time left to stock option expiry. I find that in most cases, options are exercised before the last quarter preceding the expiry date. For these options, CEOs exercise shortly after a large stock price increase, which is consistent with CEO market timing ability. I also find that stock options exercised close to expiry are not driven by private information. Options exercised far from expiry are driven by private information about the future. CEOs exercise stock options and hold the shares when they expect a positive stock performance over a long term horizon and sell the shares otherwise. The results of the chapter suggest that CEOs time their stock option exercises to occur on the most favorable day and backdate some exercises when the obtained shares are held.

RÉSUMÉ

Ce chapitre teste si la décision d'exercer les stock-options est générée par l'expiration des options ou par des informations privées. Il examine les exercices des stock-options en fonction de l'utilisation des actions obtenues (à savoir la vente ou la détention) et et par rapport à la durée de vie restante aux stock-options. Les résultats montrent que les exercices d'options interviennent, dans la plupart des cas, avant le dernier trimestre précédant l'expiration. Pour ces options, les dirigeants exercent peu de temps après une forte augmentation du prix des actions, ce qui est cohérent avec la capacité d'anticipation du marché. Si les exercices d'options proches de l'expiration sont dues uniquement à l'expiration, les exercices loin de l'expiration sont dues à des informations privées sur le futur. Les dirigeants exercent leurs options et détiennent les actions quand ils attendent une performance positive des actions sur le long terme et revendent les actions dans les autres cas. Les résultats suggèrent que les dirigeants choisissent le moment opportun pour exercer leurs options et antidatent quelques exercices lorsque les actions obtenues sont détenues.

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2.1 Introduction

Stock option compensation represents a large part of the CEOs' compensation, sometimes half of their cash compensation: salary and bonuses (Aboody and Kasznick (2000)). Companies use stock option compensation to align CEOs' interest with those of shareholders in order to mitigate the agency problems between owners. They give CEOs incentives to maximize the firm value. However, CEOs may act opportunistically by using their private information to increase the stock price in the pre-exercise period or to time their option exercises to occur shortly after a stock price increase or shortly before a stock price drop.

Previous studies have investigated the use of private information to time stock option exercises. Most of these studies assume that CEOs sell the shares obtained from option exercises based on private bad news that should be reflected in a negative abnormal performance in the post-exercise period (Carpenter and Remmers (2001), Huddart and Lang (2003)). Such studies fail to find negative abnormal performance following stock option exercises and conclude that CEOs do not use their private information to time their stock option exercises. Because these studies do not control for the possible use of obtained shares (i.e. sale or holding) they find no evidence of the use of private information to time stock option exercises.

Other studies consider the use of underlying shares (Aboody et al. (2008), Cicero (2009)). They find a positive abnormal performance in the post-exercise period for exercises not followed by sales and a negative abnormal performance for exercises followed by sales. They conclude

that CEOs exercise their stock options and hold the shares when they expect the stock to perform well in the future and sell the shares otherwise.

These studies assume that the exercise decision is independent of the time left to option expiry. In comparison to the literature, this research provides a sharper test for the use of private information distinguishing between exercises that are more or less likely to be driven by private information. This distinction is possible by differentiating exercises depending on their time left to expiry: close-to-expiry options have to be exercised and are therefore unlikely to be driven by private information. Hence, if option exercises are driven by private information, stock patterns for option exercises made close to expiry should be different from others.

Examining CEO exercise behavior requires detailed information about their stock option compensation and databases do not provide all the details on stock option plans and exercises. Using detailed hand-collected data, I analyze CEO exercise decisions and their incentives to manipulate stock option exercises.

This research extends the existing literature by studying CEO stock option exercises taking into account both the use of the underlying shares and the time left to option expiry and by providing a sharper test for the use of private information and CEOs' ability to exercise their stock options in the most favorable day.

I start with an event study to analyze CEO incentives to manipulate stock option exercises and their timing ability. I test whether the stock option exercise decisions are unrelated to recent stock price movements. Without taking into consideration the use of the obtained shares and for the time left to expiry of the exercised stock options, I find that stock option exercises are preceded by + 2 % of abnormal stock performance over a 20-day period (Cumulative Abnormal Returns CAR[-20; -1] = + 2 %) and are followed by a slightly positive abnormal performance (CAR[+1; +20] = + 0.48 %). CEO exercise decisions are made in response to stock price movements. This result is consistent with CEO market timing ability. CEOs time stock option exercises to occur after a larger stock price increase.

After exercising stock options, CEOs can decide to sell the obtained shares or to hold them for a while. To study CEOs' different exercise behavior I split the sample according to the use of the underlying shares: a) Sale Subsample in which CEOs sell the obtained shares within 5

trading days of exercise. [1] These exercises represent 65.4 % of exercises; b) Holding Subsample in which CEOs hold the shares (do not sell shares immediately). These exercises followed by no stock sale represent 34.6 % of all option exercises.

CEOs can exercise their stock options from the vesting date until the options' expiry date. To distinguish between exercises that occur far from expiry and those that occur close to expiry, I split the sample according to the time left to expiry: c) Far from Expiry Subsample: exercises that occur before the final three months left to expiry (81.5 % of all exercises)[2]; d) Close to Expiry Subsample: exercises that occur during the last three months before expiry (18.5 %).

Over a longer horizon, there is a positive abnormal performance of 1.93 % over the 6-month period following option exercises. This result shows that CEOs exercise their stock options after a stock price increase but it provides no evidence of the use of private information about the future to time the option exercises. Without controlling for different exercise behavior, it appears that CEOs exercise their stock options for diversification purposes.

I then analyze CEOs' stock option exercise behavior according to the two possible uses of underlying shares and to time left to expiry. I find that when stock options are far from expiry, the exercises occur shortly after a stock price increase. I also find that the magnitude of stock price movements depends on the use of the obtained shares.

First, I consider the subsample where CEOs exercise stock options and sell acquired shares (Sale Subsample). The hypothesis is that CEOs sell acquired shares when they expect a poor or negative stock performance in the post-exercise period (private bad news). Without taking into account the time left to option expiry, I find a positive abnormal performance of 1.35 % (significant at 10 % level) in the post-exercise period which is not consistent with the hypothesis.

Second, I consider the subsample where CEOs exercise stock options and hold the shares (Holding Subsample). CEOs with tax minimization incentives exercise their stock at a lower price and hold the shares. By holding shares, CEOs postpone the payment of taxes and obtain

[1] To check robustness, I consider a 1-trading day period and a 10-trading day period for the sale of the obtained shares and the result is almost the same as using a 5-trading day period because usually CEOs sell the obtained shares immediately after the stock option exercise.

[2] In this chapter, I use alternative definitions for the time left to expiry to check the robustness of the results, I use different periods of time left (i.e. 1 month, 2 months,...) and the result remains qualitatively similar.

a tax rebate. [3] Consistent with this hypothesis, I find that exercises followed by no sales occur after a lower stock price increase (CAR[-20; -1] = 1.20 %). Concerning the use of private information, the hypothesis is that CEOs who expect a good stock performance in the future (private good news), will exercise stock options and hold the shares. Consistent with this hypothesis, I find that exercises associated with no immediate stock sale are followed by a positive abnormal performance of 3.03 %.

Third, I consider the subsample where CEOs exercise stock options during the last three months before expiry (Close to Expiry Subsample). As long as the stock price at the exercise date is higher than the options' exercise price, CEOs will decide to exercise the options instead of losing them. CEOs with options that will expire in few weeks, exercise these options after a weak stock price decrease (CAR[-20; -1] = − 0.22 %) and before a stock price increase (CAR[+1; +140] = 3.24 %). Stock option exercises that occur close to expiry are driven by expiry and not by private information.

Next, I consider the subsample where CEOs exercise stock options before the last three months (Far from Expiry Subsample). These exercises represent 81.5 % of stock option exercises. CEOs with time flexibility will exercise stock options after a stock price increase. Consistent with this, I find a positive abnormal performance of 2.50 % in the pre-exercise period.

Afterwards, I combine the use of underlying shares and the time left to expiry of the exercised stock options. CEOs who exercise stock options far from expiry, sell shares when they expect a poor future stock performance and hold shares when they expect a positive future stock performance. Consistent with this hypothesis, I find a non-significant positive abnormal performance over the six-month period following options exercises when shares are sold (CAR[+1; +140] = 0.66 %) and a positive abnormal performance when shares are held (CAR[+1; +140] = 3.46 %). This result is consistent with the use of private information about the future to time option exercises when CEOs have some time flexibility.

Thus, without controlling for stock options' time to expiry when CEOs sell or hold the obtained shares, it would have been difficult to identify stock patterns consistent with the use of

[3] CEOs who hold the shares for at least two years obtain a tax rebate on the acquisition gain which is computed as the difference between the stock price at the exercise date and the exercise price of stock options. The acquisition gain is taxed at the exercise time and the payment is only made at the time of sale of the obtained shares. CEOs also obtain a tax rebate on the gains from sales if they hold the shares for two years or more.

private information about the future to time stock option exercises.

CEOs have 5 trading days to report their transactions to the AMF. I compute the probability of how favorable the stock price is at the exercise date compared to the stock price during these 5 trading days. I distinguish between option exercises that are followed by stock sales and others. I find 25.68 % exercises followed by stock sales occur at the maximum stock price. This result provides evidence about the information timing of CEO stock option exercises followed by stock sales. I also distinguish between option exercises that occur far from expiry and those that occur close to expiry. 29.62 % stock option exercises made far from expiry and followed by stock sales occur at the maximum stock price; this result provides further evidence about the information timing of exercises when CEOs have time flexibility.

Now looking at stock option exercises not followed by stock sales. I find that 33.69 % of these exercises occur at the minimum stock price, CEOs report an exercise date at which the stock price was the lowest when they hold the obtained shares; this could be due to backdating. This practice is not illegal as long as there is board agreement and public disclosures (AMF, shareholders, ...) which are nevertheless unlikely. Backdating option exercises not followed by stock sales is possible, however it is risky from a reputational point of view; companies allowing this behavior may lose their CEOs and risk lawsuits. By reporting an exercise date in which the stock price is lower, CEOs lower the taxes they pay on the gain from acquisition but of course they will increase the tax they pay on the gain from stock sales. In France, CEOs can obtain a tax rebate of 50 % or more on the gain from sales if they hold the shares for at least two years. Acquisition gain will also be taxed less when shares are held for at least two years if the options were granted between 2000 and 2012.

I find results consistent with backdating of option exercises followed by no stock sales: when CEOs hold the shares, they report the date at which the stock price was the lowest.

Finally, I run OLS regressions using the abnormal performance measured in the pre- and post-exercise periods as dependent variables and the size of option exercises, use of the underlying shares, time left to expiry and other variables as independent variables. I also control for firm and CEO characteristics.

The regression results show that the size of the option exercises does not impact the pre- and post-exercise stock performances and that CEOs exercise their stock options after a higher

price increase when stock options are exercised far from expiry and when they decide to sell the obtained shares. Using the post-exercise abnormal performance, the regression results show that CEOs who expect poor future stock performance will exercise stock options and sell the obtained shares when they have time flexibility, which is consistent with private bad news.

The remainder of the chapter is organized as follows. Section 2.2 reviews the related literature and develops the hypotheses. Section 2.3 discusses stock option lifetime and taxes CEOs have to pay following stock option exercises. Section 2.4 presents data summary statistics. Section 2.5 focuses on the methodology and the interpretation of the results. In section 2.6, I present robustness checks and I conclude the study in section 2.7.

2.2 Related literature and hypotheses development

This research is related to the stock option awards and exercises literature. For non-executives, Huddart and Lang (2003), using a sample of 50,000 employees option exercises in eight corporations, find that most exercises occur several years before expiry and that the exercise decision is a response to recent stock price movements. Core and Guay (2001) examine the option exercises made by non-executives and find that stock option exercises increase when the stock price is above a 12-month high. However, they do not find that the option exercises reflect private information about future returns. In this study, to examine the use of private information and market timing, I consider only CEO exercise decisions because CEOs have preferential access to valuable information.

Debate and controversy caused by practice around CEO stock option awards and exercises prompted researchers to focus on executives' opportunistic behavior around stock option awards and exercises and to test for the manipulation of stock options.

Yermack (1997) provides evidence about CEO timing ability for unscheduled option awards to occur prior to the release of good news. [4] Conversely, Heron and Lie (2007) attribute the stock price pattern around stock option awards to the manipulation of the reported dates (Backdating)

[4] Option awards are considered as scheduled if they occur within two business days compared with the previous year, or on the same day every year and unscheduled otherwise.

of unscheduled stock option awards before the SEC 2002 requirements. [5] Aboody and Kasznick (2000) find that CEOs increase their stock option compensation by managing the timing of voluntary disclosures around award dates by delaying good news and rushing forward bad news. They disclose bad news before the award dates in order to obtain stock options with a lower exercise price and so to maximize the value of the option awards.

Around stock option exercises, studies focus on stock option exercise behavior in the USA. Some studies control for the use of underlying shares but do not account for stock options' time left to expiry. CEOs might behave differently when they have to exercise stock options that expire soon. The stock price movements around stock option exercises might be different depending on the time left to expiry and/or the reason why CEOs exercise their stock options. CEO stock option exercises could be driven by private information or simply by expiry.

Research (Carpenter and Remmers (2001), Cicero (2009)) found that, in aggregate, stock option exercises occur after a stock price increase. When CEOs exercise stock options, in most cases, they can choose between two main decisions: sell the obtained shares or hold them. Cicero (2009) and Aboody et al. (2008) distinguish between the two possible uses of the underlying shares and find that CEOs exercise their stock options after a stock price increase, when they sell the shares, and after a stock price decrease when they hold the shares. The decrease in the pre-exercise period in the case of shareholding is explained by taxes. When CEOs intend to hold the shares, they have tax minimization incentives to exercise at a lower stock price.

I start by examining the relation between CEOs' exercise behavior and stock price levels in the pre-exercise period. The first hypothesis states that CEOs exercise their stock options, on condition that stock options are in the money, without conditioning their exercises on stock price levels.

Hypothesis 1. *The exercise decision is unrelated to stock price movements.*

To test this hypothesis, I examine stock price patterns shortly before the stock option exercises. If the option exercise decisions (and the decision to hold or to sell the obtained

[5] The U.S. Securities and Exchange Commission imposed that awards be scheduled and the transactions reported within two business days. Before the Sarbanes Oxley Act (SOX) of 2002, CEOs had up to the 10th day of the following month to report their transactions. The SOX requirements significantly reduce CEOs' ability to backdate their option awards and exercises.

shares) are made regardless of stock price levels, no stock price patterns before stock option exercises should be observed.

Alternatively, when CEO exercise decisions (i.e. to choose whether and when to exercise and what to do with the obtained shares) are related to stock price levels, I should find a stock price pattern before the exercise dates. Exercises may occur after a stock price increase or before a stock price drop. Stock price patterns should depend on whether the options are exercised close or far from expiry and on whether the obtained shares are sold or held.

CEOs may also have the ability to time the market. Their market timing ability is the ability to predict the future direction of the market (future price movements). It was initially tested by Baker and Wurgler (2002) who find that CEO capital structure decisions are directly related to the market value. CEOs issue equities when the market value is high relative to the book value and to past values, and repurchase equities when the market value is low. They find that high leveraged firms raised funds when market valuations were low and vice-versa. They provide strong evidence of CEOs' market timing ability when choosing the capital structure of their companies.

Using their result, I examine the CEOs' market timing ability related to their private benefit by looking at the pre-exercise stock price performance. I find results consistent with CEOs' market timing ability when they exercise their stock options. CEOs can choose the appropriate time to exercise their stock options which could be also interpreted as information timing of exercises to occur at the right moment.

When CEOs do not have private information about the future, they exercise their stock options because they need liquidity or because they are under-diversified or for other reasons. In the absence of private information no abnormal stock performance should be observed in the post-exercise period over both the short term and the long term. Conversely, if CEOs have private information, they will use it to choose whether and when to exercise their options and whether they sell the obtained shares or hold them.

Testing for the existence of private information implies considering the post-exercise patterns over a long term horizon. Research explains the stock price patterns in the post-exercise period in different ways. Aboody et al. (2008) provide evidence of the use of private information to increase the profit of stock option exercises. They find that exercises followed by immediate

sale of all shares are associated with negative abnormal returns in the post-exercise period, consistent with private bad news, and those followed by no immediate sale are associated with positive abnormal returns which is consistent with good news. One limit on this study is that CEOs may exercise their stock options because they have to exercise the options and not because they have private information, which may lead to a post-exercise stock performance

In theory CEOs should not hold the shares; Carpenter and Remmers (2001) show theoretically that the strategy of exercising stock options and holding shares is not optimal. Because of lack of data, Carpenter and Remmers (2001) assume that all option exercises are followed by immediate sales of the obtained shares, implying negative abnormal performance in the post-exercise period if the exercises are based on private information. Nevertheless, they do not find such negative abnormal performance. They conclude that stock option exercises appear to be driven by liquidity and diversification needs instead of by private information.

In contrast, McDonald (2003) shows that the returns of exercises followed by immediate sale are sometimes lower than the returns of the exercises followed by no sale. He demonstrates that the strategy of exercising stock options and holding shares could be optimal when CEOs plan a potential future increase in the ordinary income tax ahead. In this research, I consider two settings depending on the use of shares obtained at the exercise time. CEOs who exercise their stock options decide (in most cases) whether to sell the shares immediately or not. [6]

To test for the use of private information about the future, I measure the stock performance in the post-exercise period using a longer period (6 months). The second hypothesis states that CEOs with private information about the future make exercise decisions depending on this information. I split this hypothesis into two subhypotheses depending on private information (i.e. positive or negative information).

Hypothesis 2a. *CEOs with positive private information about the future will exercise the stock options and hold the obtained shares.*

Hypothesis 2b. *CEOs with negative private information about the future will exercise the stock options and sell the obtained shares.*

[6] If the shares obtained through stock option exercises are sold within 5 trading days of exercise, I consider that CEOs sell the underlying shares. Usually when CEOs intend to sell shares, they do it on the exercise date or on the following trading day). Otherwise, I consider that CEOs hold the shares.

CEOs who expect an increase in stock price in the long run should exercise the options to fix the acquisition gain that is highly taxed and hold the shares. I expect a positive post-exercise stock pattern when CEOs exercise their stock options and hold the obtained shares which is consistent with private good news (positive private information). For stock option exercises followed by stock sales, I expect a negative abnormal performance in the post-exercise period.

An important issue is that even if there is no stock price movement in the post-exercise period, it does not mean that CEOs do not have private information, they can just wait until private good news becomes public to exercise the options; in this case they still have private information that they use to choose when to exercise the stock options.

Past studies assume that stock options are exercised well before expiry, some of them do not find evidence of the use of private information when CEOs exercise their stock options. These results might be due to stock options that are exercised close to expiry. When CEOs do not have time to wait, they exercise their stock options before losing those options. The chapter's third hypothesis, separates stock option exercises occurring far from expiry from exercises that occur close to expiry. It is important to differentiate between option exercises with respect to the time left to expiry, because options exercised close to expiry are less likely to be driven by private information.

Hypothesis 3. *Stock options exercised close to expiry are not driven by private information.*

I expect no abnormal stock performance when stock options are exercised close to expiry. CEOs exercise their stock options otherwise they lose these options since they cannot sell them. When stock options are exercised far from expiry, the exercises are made for diversification or liquidity needs, or based on private information about future performance. I expect different patterns depending on the use of the underlying shares. Over the long term, I expect poor stock performance for option exercises followed by sales and high performance for those followed by no sales which indicate the use of private information when CEOs have time flexibility.

Cicero (2009) exploits the change in reporting required by the SOX Act of 2002. He finds that when CEOs had up to ten days of the following month to report their transactions to the SEC (before SOX Act 2002), the exercises were backdated (manipulation of the reporting dates);

however when CEOs had just two days to report their transactions, the exercises were timed based on private information.

Cai (2007) attributes the stock price patterns around stock option exercises to the manipulation of exercise dates, also called "Backdating". CEOs report an exercise date in which the stock price was the highest in the case of option exercises followed by stock sales, and the lowest in the case in which shares are held in order to pay lower taxes. In the French context, backdating is not an issue, since CEOs have to report their transactions to the AMF [7] within 5 trading days of exercise, so CEOs do not have time to manipulate the reporting of the exercise date. However, during the 5 trading days in which CEOs have to report their stock option exercises, they may choose to report a different exercise date with a more favorable stock price. This chapter tests for backdating and finds results consistent with this practice when CEOs exercise their stock options and hold the obtained shares. CEOs have no incentive to report an exercise date in which the stock price is higher. Moreover, when CEOs exercise their stock options and sell the shares immediately after the exercise, they cannot report a higher stock price than the current price since no one will accept to purchase the shares at a higher price. Consistent with this, Cicero (2009) finds that backdating is less likely to occur when the shares are sold in the stock market than when the shares are not sold.

Bartov and Mohanram (2004) provide evidence of the use of private information that comes from earnings management to increase the benefit of only large option exercises. In this research I consider all option exercises whatever the size. To check for robustness, I use only the most important exercises (more than 10,000 options as defined by Bartov and Mohanram (2004)) and find similar results.

Sautner and Weber (2011) examine the relation between executive stock option contracts and corporate governance structures in large European companies. They find that companies suffering from weak corporate governance grant their CEOs with more favorable option plans. I collect data on CEO characteristics by hand (CEO dual position and CEO last year in position), and find weaker evidence of the use of private information by CEOs with dual positions. In the literature, duality is considered as a sign of weak corporate governance which does not explain why CEOs with dual positions make less use of their private information. This result is

[7] Autorité des Marchés Financiers (The French Financial Markets Authority).

inconsistent with the fact that CEOs in companies with weaker corporate governance are more likely to behave opportunistically in order to increase their private benefit. Unless duality is also an indicator of founder or large shareholder.

If these CEOs are the major shareholders or the founders, this result will be consistent with the fact that CEOs in companies with stronger corporate governance are less likely to use their private information to increase their own benefit. Ginglinger and Hamon (2011) investigate ownership structures of 1,550 French firms. They find that in France 70.1 % are family-controlled firms. In the final sample of this study, there are only large and listed companies which are less likely to have family ownership; if CEOs in these companies are family members; they may behave in the best interest of shareholders which could explain the results of lower use of private information to time stock option exercises.

It would be interesting to address the relation between exercise behavior and corporate governance, in more detail, in future research.

Several questions related to insider trading have been treated by researchers essentially using U.S. data. Cohen et al. (2012) separate trades made by opportunistic insiders and those made by routine insiders. They argue that opportunistic trades predict future news and events at a firm level while routine trades do not. They find that opportunistic traders sell (buy) stocks before a stock price drop (increase) within a month. I consider CEOs who exercise stock options far from expiry as opportunistic traders. They choose the time and the proportion of options they want to exercise. Because CEOs have privileged access to information about the firm, there is a higher probability that they will exercise stock options shortly after a stock price increase and/or before a stock price drop.

Insider trades convey information to the market. Allowing these insiders to trade is the best way to reveal their private information to the market, which is consistent with the finding of Carlton and Fischel (1983) and with the findings of this chapter. Stock option exercises made far from expiry and followed by holding the obtained shares are driven by private good news.

In their study, Collin-Dufresne and Fos (2012) use standard liquidity measures (i.e. Kyle's Lambda, The Easley et al. (1996) Pin measure) in order to reveal the presence of informed traders "Schedule 13D filers". They find that liquidity measures cannot be used as proxies for information asymmetry because these measures are not robust to the informed trader's ability

to select when and how much to trade, and so do not reveal the presence of informed traders. However, these measures suggest that a stock is more liquid (lower adverse selection) in the presence of significant informed trading in that stock. I collect data about the bid-ask spread before CEO stock option exercises to test for the relation between stock option exercises and liquidity.

2.3 Stock option lifetime and taxes

Figure 2.1 presents stock option lifetime and different gains option holders obtain from stock option exercises and share sales.

CEOs receive stock options that give them the right to buy shares with an average of 10 years lifetime at a preferential price. They receive the options at price K which is equal to the stock price at the award date or to the 20-day pre-award period stock price average. CEOs can start to exercise the options around 4 years (sometimes 3 or 5 years) after the award date; this period is called the "Unavailability period"; they can then exercise the stock options over 6 years (vesting period) until the expiry date.

When CEOs exercise stock options, they buy shares of value P_{Ex} (stock price at the exercise date) at price K, they make a capital gain from acquisition: $\pi_A = P_{Ex} - K$, this gain is taxed at the exercise time. If the CEOs decide to hold the shares, they postpone the payment of taxes on the acquisition gain, since these taxes are paid when the shares obtained through stock option exercises are sold.

In France, the gain from acquisition is taxed at a tax rate of 30 % for the annual amount below 152,000 € and 41 % for the amount exceeding 152,000 €. The gain from acquisition is less taxed when the obtained shares are held for at least two years: the tax rate is 18 % for the amount below 152,000 € and 30 % for the rest. CEOs who exercise stock options that were granted between April 27, 2000 and September 28, 2012 can opt for the gain from acquisition being taxed as salaries or wages at gradual income tax rates. In the sample of this study, almost all stock options were awarded during this period. From September 28, 2012 the acquisition gain is taxed as salaries and wages at gradual income tax rates.

Tax incentives may impact CEOs' exercise behavior. Those who expect a stock price

increase have tax incentives to exercise the options before the stock price increase, in order to fix the acquisition gain, then hold the obtained shares so that the subsequent stock price increase will be taxed as sales gain.

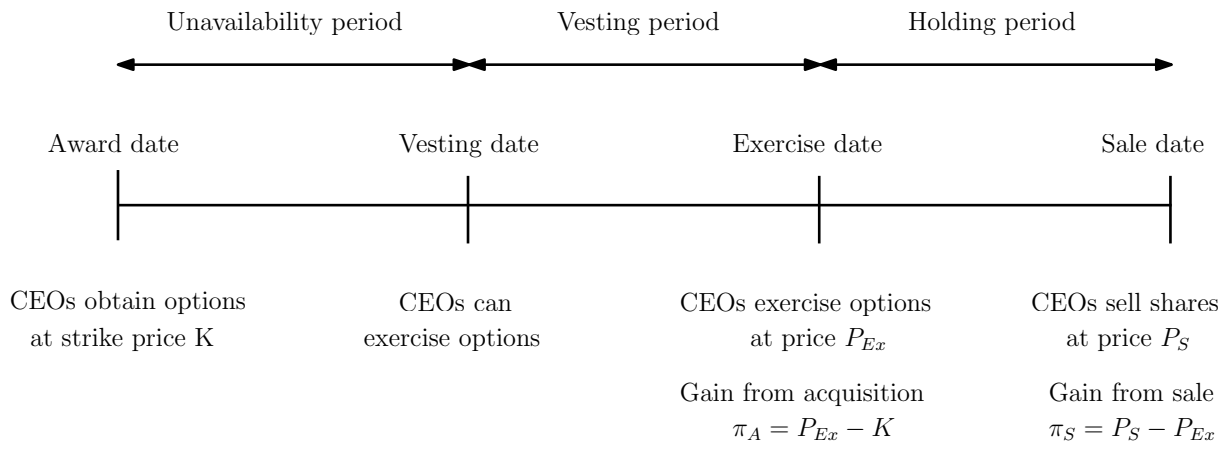

Figure 2.1 – Stock Option Life Time.

CEOs can sell the obtained shares immediately after the exercise date in order to reduce their exposure to the company's risk or wait and sell later. When CEOs sell shares at price P_S (stock price at the sale date), they make a capital gain from sales: $\pi_S = P_S - P_{Ex}$. The gain from sales is taxed at gradual income tax rates as capital gain on security sales.

In addition to pay less taxes on the gain from acquisition, CEOs may obtain a 50 % tax rebate on the gain from sales if they hold the shares for at least two years (the tax rebate is 65 % if the shareholding period is longer than eight years).

Because of tax rules, CEOs who foresee a stock price increase have an incentive to exercise their options and hold the shares. I expect a weaker stock price pattern in the pre-exercise period when CEOs hold the obtained shares because they have tax minimization incentives to exercise at a lower stock price, and a higher stock price pattern in the post-exercise period.

2.4 Data description and summary statistics

Financial data such as: daily stock price, market capitalization, etc are obtained from Thomson Reuters Datastream. For the benchmark portfolio, I use the value weighted market index: «CAC

All Tradable». A robustness check using an equally weighted index does not significantly alter the results of the study.

I collected by hand detailed data about CEO stock option exercises of 116 French companies making up the SBF120 index [8], made during the 8-year period beginning on January 1, 2007 ending on December 31, 2014. I collected the information about stock options exercised by CEOs in position during the company fiscal year (exercise price, exercise date, award date and vesting periods of options exercised, number of options exercised, number of options initially awarded, etc) from companies' annual reports.

The transactions made by CEOs must be reported to the AMF within 5 trading days. I use the report of CEOs' transactions to the AMF to match the information and to verify the exactness of annual reports information. In the initial sample, there are 722 stock option exercises made between 2007 and 2014 by 81 CEOs of 72 companies. These option exercises include 23 option exercises made by 12 CEOs in 12 companies not reported to the AMF. I exclude these non-reported exercises. I also exclude one exercise reportedly made on a Saturday. I thus obtain a sample with 698 option exercises of 221 different stock option plans made by 71 CEOs of 67 French companies. The option plans in the sample were granted between 1997 and 2009. I consider exercises made during the same day by the same CEO as one observation and I exclude exercises that belong to different plans with different groups of time left to expiry (i.e. less than 3 months / more than 3 months). In the final sample, there are 540 exercises made by 71 CEOs at 67 companies in which 65.4 % are followed by immediate sale. [9]

About 81.5 % of stock options are exercised far from expiry. [10] This result is consistent with those of U.S. studies, however, when analyzing the stock option exercises, researchers do not consider the case in which stock options are exercised close to the expiry date, they consider that all option exercises occur well before expiry.

To distinguish between different exercise behavior, it is important to account for the difference between option exercises made close to expiry and exercises made far from expiry.

[8] I exclude the non-French companies of the SBF 120 because of differences in the reporting requirement that makes detailed information unobtainable.

[9] If the obtained shares are sold within 5 trading days of exercise, I consider that these exercises are followed by immediate sale.

[10] Options exercised far from expiry are defined as those exercised at least before the last three months.

The annual distribution of exercises in Table 2.1 shows that a large number of exercises is made in 2007, in 2010, in 2011 and in 2014; however, just a few exercises occur in 2008 and 2009.

Table 2.1 – **Annual distribution of option exercises.**

This table presents the annual distribution of option exercises in the final sample. It also presents the distribution of exercises for subsamples regarding the use of shares and the time left to option expiry. The Sale subsample includes the option exercises followed by sales of shares within 5 trading days and the Holding subsample includes exercises not followed by sales. Time left to expiry is defined as the time between the exercise date and the expiry date. The Far subsample contains options exercised at least three months before expiry and the Close subsample contains those exercised during the last three months.

		Use of underlying shares		**Time left to Expiry**	
Year	All Exercises	Sale Subsample	Holding Subsample	Far Subsample	Close Subsample
2007	85	44	41	74	11
		51.8 %	48.2 %	87.1 %	12.9 %
2008	38	26	12	23	15
		68.4 %	31.6 %	60.5 %	39.5 %
2009	37	25	12	31	6
		67.6 %	32.4 %	83.8 %	16.2 %
2010	75	52	23	72	3
		69.3 %	30.7 %	96 %	4 %
2011	85	65	20	58	27
		76.5 %	23.5 %	68.2 %	31.8 %
2012	67	47	20	59	8
		70.1 %	29.9 %	88.1 %	11.9 %
2013	70	39	31	54	16
		55.7 %	44.3 %	77.1%	22.9 %
2014	83	55	28	69	14
		66.3 %	33.7 %	83.1 %	16.9 %
Total	540	353	187	440	100
Percentage		65.4 %	34.6 %	81.5 %	18.5 %

About 65.4 % of option exercises made between 2007 and 2014 are followed by immediate sale of the obtained shares and 34.6 % by no immediate sale. The fraction of exercises not followed by stock sales declines over time from 48.2 % in 2007 to 23.5 % in 2011. Only a few exercises occur close to expiry in 2010.

Figure 2.2 shows the yearly distribution of stock option exercises made between 2007 and 2014 with respect to time left to expiry. Time left to expiry is computed as the expiry date minus the exercise date (I calculate using trading days), I then classify the exercises as those that occur in the year of expiry, the year before expiry, etc.

This figure (2.2) shows that options are exercised during the last year before expiry (around 43.7 % of exercises); this result is different from the result of U.S. studies which consider that all option exercises occur several years before expiry. For example, Cicero (2009) finds that options are exercised on average 4 years before expiry.

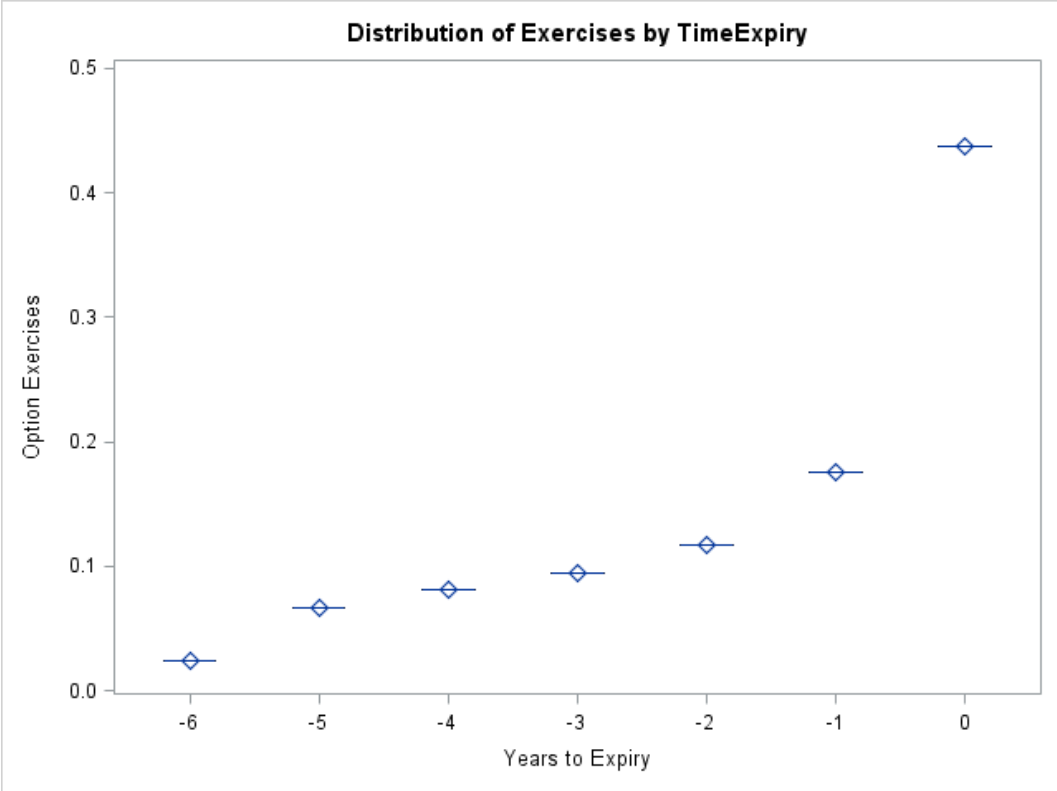

Figure 2.2 – Yearly Distribution of option exercises with respect to the time left to expiry.

Figure 2.3 shows the monthly distribution of the option exercises made during the last year before expiry (43.7 % of the exercises in the final sample). Exercises made during the last year are defined as those that are made within the 264-trading day period before expiry dates. About 9.6 % of all exercises are made during the last month (22 % of the exercises made during the last year) and 18.5 % are made during the last quarter (42.3 % of the exercises made during the last year).

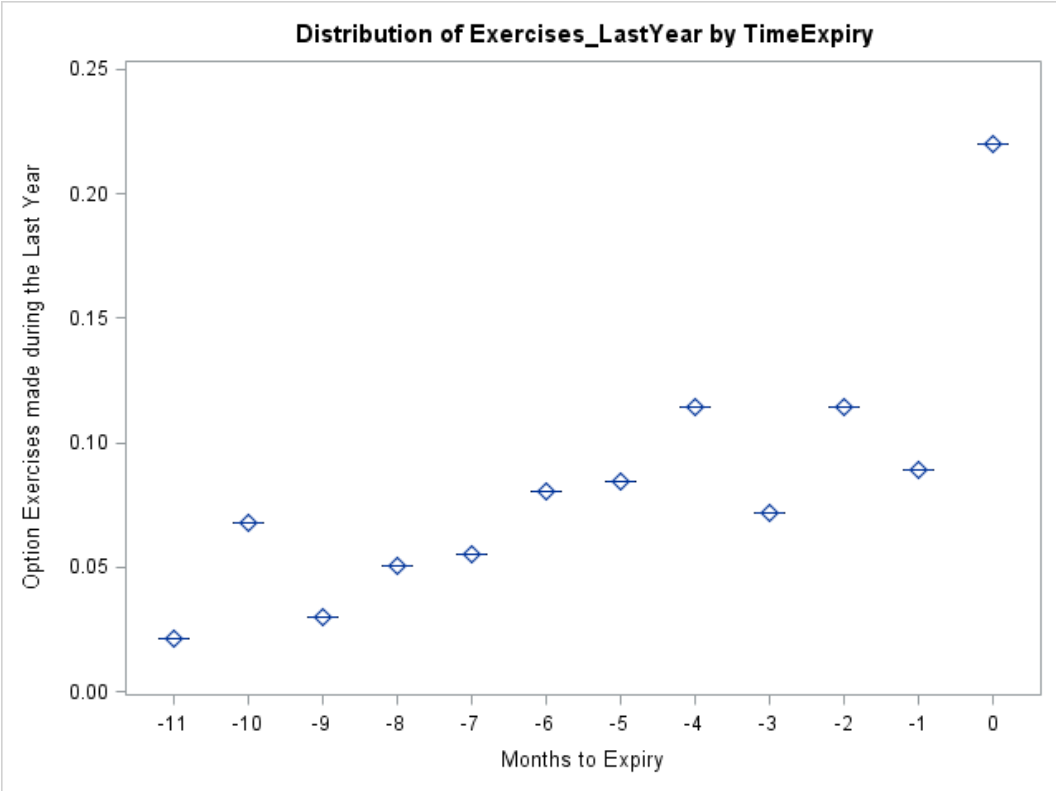

Figure 2.3 – Distribution of option exercises made during the last year.

CEOs who exercise stock options before the expiry date sacrifice a significant portion of potential value they can obtain from the stock option exercise. In theory, risk neutral CEOs should hold the stock options until the expiry date, unlike risk averse CEOs who should exercise stock options close to the vesting date in order to reduce their risk exposure to their own company stocks. In the sample, only 12.7 % of exercises occur during the first year of vesting and 2.4 % of exercises occur during the first month of vesting.

Table 2.2 presents a few statistics of stock option exercises made between 2007 and 2014 by 71 CEOs in 67 large French companies. Panel A of Table 2.2 reports summary statistics of the final sample, the average (median) number of options exercised is around 53,008 (23,795). The average (median) size [11] is 1.638 (0.600) Million €, representing 52.1 % the CEOs' annual compensation[12] on average (median = 19.6 %). At the exercise date, CEOs buy shares at a pre-determined stock price which is lower than the stock price at the exercise date. CEOs obtain

[11] $Size = Number\ of\ Options \times Strike\ Price$

[12] CEO annual compensation includes salary, bonuses, stock grants, option grants and other compensation.

a gain from acquisition of 1.527 Million € on average, at the exercise date (median = 0.475 Million €). For each option exercised, CEOs obtain an average return of 132.9 % (median = 85.55 %). [13]

Table 2.2 – **Summary statistics.**

This table presents the summary statistics of option exercises in the final sample. Panel A presents the summary statistics of option exercises made by CEOs of French Companies. Panel B presents the summary statistics (mean) of the option exercises with respect to the use of underlying shares and to the time left to expiry.

Panel A	**Stock Option Exercises made between 2007 and 2014**					
	N	Mean	Median	Std Dev	Minimum	Maximum
Options Exercised (#)	540	53,008	23,795	100,955	4	985,000
Size of Exercise (Million €)	540	1.638	0.600	3.508	0	39.072
% Size (Size/ Annual Compensation)	540	52.1 %	19.6 %	106.9 %	0.001 %	1165.94 %
Acquisition Gain (Million €)	540	1.527	0.475	4.530	0	50.191
Rate Return (%)	540	132.9 %	85.55 %	177.7 %	0 %	2062.44 %
Market Capitalization (Million €)	540	16,346	7,562.26	19,535	85.41	135 980
Companies (#)	67					
CEOs (#)	71					
Panel B		**Use of underlying shares**		**Time left to Expiry**		
	All Exercises	Sale Subsample	Holding Subsample	Far Subsample	Close Subsample	
Option Exercised (#)	53,008	45,574	67,042	49,889	66,735	
Size of Exercise (Million €)	1.638	1.315	2.249	1.377	2.786	
% Size (Size/ Annual Compensation)	52.1 %	48.6 %	58.7 %	48.6 %	67.8%	
Acquisition Gain (Million €)	1.527	1.005	2.514	1.521	1.554	
Rate Return (%)	132.9 %	120.8 %	155.7 %	146.3 %	74.2 %	
Market Capitalization (Million €)	16,346	14,443	19,939	15,349	20,733	
N	540	353	187	440	100	
Percentage	100 %	65.4 %	34.6 %	81.5 %	18.5 %	

Panel B of Table 2.2 shows the summary statistics of the final sample for each subsample with respect to the use of underlying shares and the time left to expiry. Option exercises followed by no immediate sale are the largest in number and in size. On average, CEOs exercise 67,042 options that represent a value of 2.249 Million €. Exercises followed by no immediate sales are more profitable, when CEOs exercise options and hold (sell) the shares, they obtain

[13] $Rate\ of\ Return = \frac{Stock\ Price\ at\ the\ exercise\ date - Strike\ Price}{Strike\ Price}$

an average gain from acquisition of 2.514 (1.005) Million € and a return of 155.7 % (120.8 %). Stock option exercises followed by no immediate stock sales are made by CEOs of larger companies, the average market capitalization is 19,939 Million €.

The average number of options exercised close to expiry (66,735) is higher than the average number of options exercised far from expiry (49,889). The size of exercises made close to expiry is larger, however, the gain from acquisition is almost the same for exercises that occur close to expiry and those that occur far from expiry.

The stock option exercises far from expiry are more profitable than exercises made close to expiry. The average return obtained by CEOs when they exercise one stock option far from (close to) expiry is 146.3 % (74.2 %). CEOs in smaller (larger) companies are those who exercise options far from (close to) expiry.

Unreported statistics show that the shares obtained from stock option exercises are sold in 66 % of cases when the exercises occur close to expiry and 65 % when the exercises occur far from expiry. It seems that the decision to sell or to hold shares does not depend on the time to expiry of the exercised options.

2.5 Methodology and results

In this chapter, I start by testing the moneyness of stock options at the vesting time. I then analyze abnormal stock performance around the exercise dates using an event study methodology. Finally, I use OLS regressions to demonstrate the effect of stock option exercises on the pre- and post-exercise abnormal performance using control variables.

2.5.1 Moneyness of stock options at vesting

In the summary statistics, I find that only 2.4 % of stock option exercises occur during the first month of vesting. CEOs appear to exercise their stock options for other reasons than vesting. This observation rises the following question: why don't CEOs exercise their stock options shortly after the vesting dates? Are the options out of the money at vesting time? To answer this question, I test for the moneyness of stock options at vesting time.

To test whether stock options were out of the money at the vesting date, I take into account all stock option plans (221 plans) with stock options exercised between 2007 and 2014 and compute the difference between the stock price at the vesting date and the exercise price of the stock options (Strike K). If this difference is negative, the options are considered as being out of the money which could explain why CEOs do not exercise their stock options when the options vest. I code a dummy variable "OutMoneyVest" 1 if the stock price at the vesting date is lower than the exercise price of options otherwise, the dummy variable equals 0. I find that only 22.2 % of the stock option plans were out of the money when they vest. I find a similar result when I test whether the option plans were out of the money during the month preceding the vesting date (21.7 % of option plans out of the money). I compute the average stock price one month before each vesting date, then compute the difference between the average stock price and the exercise price of the stock options. This result shows that CEOs wait to exercise their stock options for other reasons than the moneyness of the stock options.

2.5.2 Event Study Analysis

The event study is based on the cumulative abnormal returns CAR measured over different periods. Following Cicero (2009), I estimate daily abnormal returns around the exercise dates as excess stock returns over market index (CAC All Tradable market index) returns: [14]

$$AR_{i,t} = R_{i,t} - R_{M,t} \tag{2.1}$$

For robustness checks, I estimate abnormal returns using the two following models:

$$AR_{i,t} = R_{i,t} - \beta \times R_{M,t} \tag{2.2}$$

$$AR_{i,t} = R_{i,t} - [Rf_t + \beta \times (R_{M,t} - Rf_t)] \tag{2.3}$$

[14] In event study analysis, researchers use the market model, but in the case of stock option exercise studies, the abnormal returns computed using the market model or other factor models may be biased downward because stock option exercises occur after a large stock price increase (Cicero (2009)). Also because there is more than one exercise made by the same CEO during the year, there is the overlapping problem and I cannot obtain an estimation period without any exercise. So, the use of the market model may lead to a biased result of expected market return.

Where: $R_{i,t}$ and $R_{M,t}$ are the daily stock and market index returns respectively, β is the coefficient obtained from the regression of stock returns on market index returns during an estimation period of one year that ends 40 trading days before the exercise dates and Rf_t is the daily risk free rate from the OECD country-specific short-term interest rate for France.

I use test statistics to assess statistical significance of abnormal returns. Aktas et al. (2007) propose a test which reduces the impact of contaminated estimation period. However, in their paper, Aktas et al. state that the test is "unreasonable for large-sample analyses". Since there are more than 500 events in the final sample, the estimation of abnormal returns is not biased.

I use an event period beginning 20 days before the stock option exercise dates and ending 140 days (around 6 months) after the exercise dates. I use a short period around stock option exercises (-20 ;+20) to test for exercise behavior and for market reaction and a longer period (140 trading days) after the exercise dates to test for the use of private information about the future to choose when to exercise stock options and to decide whether to sell or to hold the obtained shares.

2.5.3 Event Study Results

a. Full sample

The abnormal returns displayed in this section are estimated using Model (2.1), unless indicated.

Figure 2.4 displays the cumulative abnormal returns from 20 trading days before the exercise dates up to 20 trading days after the exercise dates.

The result using the whole sample, shows that in aggregate, the stock option exercises occur after a stock price increase and not before a stock price drop CAR[-20; -1] = 2 % (significant at 1 % level). This result is consistent with that of US studies. CEOs time their stock option exercises to occur shortly after a stock price increase. Result of Figure 2.4 rejects the first hypothesis which states that the stock option exercise decision is unrelated to stock price movements. CEO stock option exercises are driven by, for example, diversification or liquidity needs.

CEO stock option exercises have no effect on stock price levels, CAR[-1; +1] = 0.16 % (not significantly different from 0). The execution of the stock option exercise does not impact stock

prices. It seems that the market does not react to the stock option exercise.

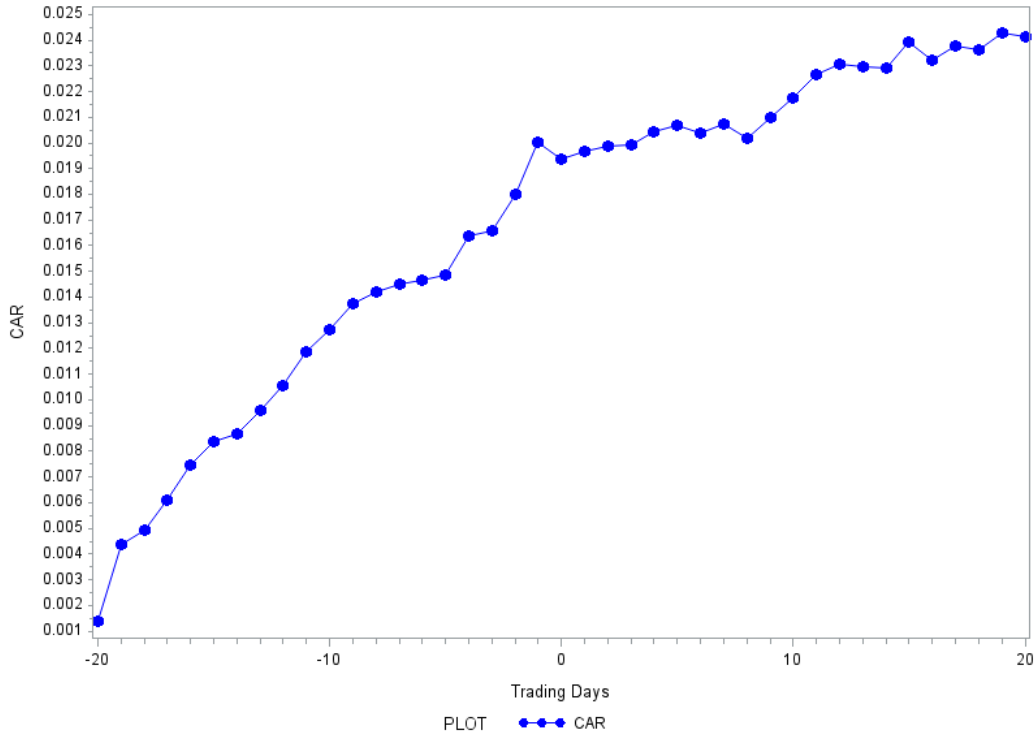

Figure 2.4 – Cumulative Abnormal Returns around the exercise dates [-20; +20]

The stock performance in the post-exercise period is close to zero CAR[+1;+20] = 0.48 % (significantly different from 0). The results are consistent with CEOs' market timing ability. The stock price increase in the pre-exercise period is higher than that in the post-exercise period. CEOs know when the run-up will end and decide to exercise their options.

Roulstone (2008) finds that the market reacts partially to the execution of insider trades and requires public disclosure of these trades. To test if the market requires a public disclosure of option exercises and really reacts more to the disclosure of option exercises than to the exercises themselves, I measure abnormal stock performance around the declaration dates to the AMF, and compare it with abnormal stock performance around the exercise dates.

I find the same stock price pattern around the declaration of stock option exercises (see Figure 2.5), however, the magnitude is weaker. There is a positive abnormal stock performance of 1.59 % (CAR[-20; -1]) preceding the declaration of stock option exercises.

The declaration of stock option exercises has no price impact. Market reaction to the

declaration of stock option exercises is weak and not significantly different from (CAR[-1; +1] = 0.09 %).

In the 20-day period following the declaration of option exercises (+1; +20), there is an increase of 0.56 %. This abnormal performance is slightly higher than the abnormal performance following the execution of the exercises but not statistically different from it.

So, in the case of stock option exercises it seems that the market reacts in the same way to the execution of the exercises as to their declaration. The plausible explanation of this finding is that because most option exercises are reported on the day of (or the day after) the exercise, I obtain the same stock price patterns around both exercise and reporting dates.

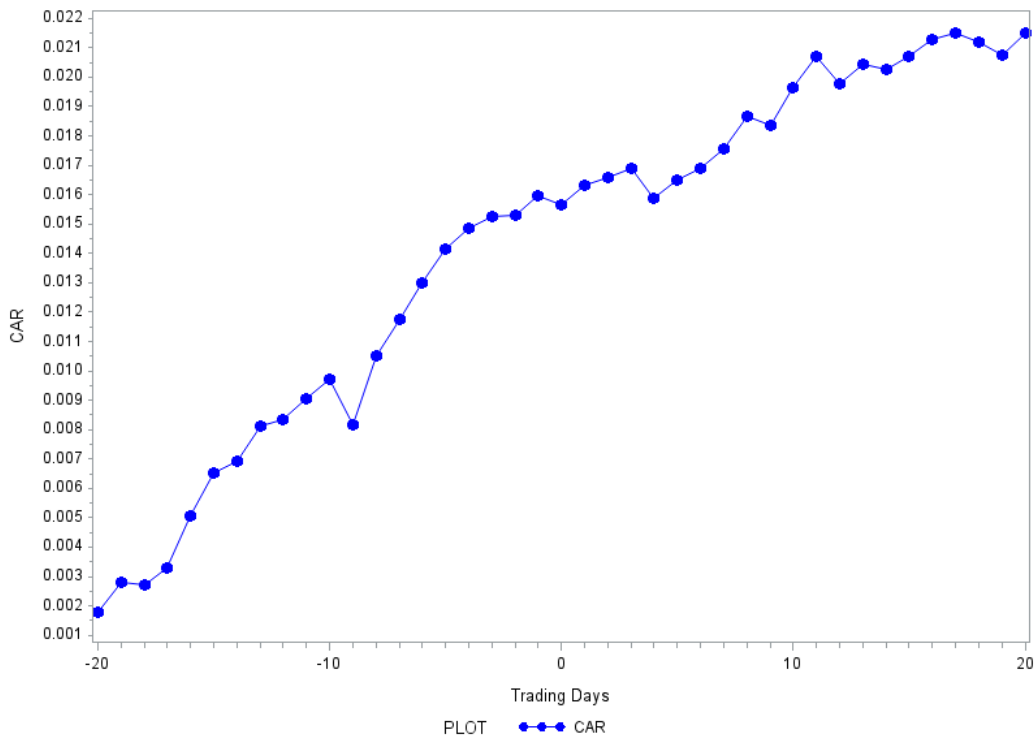

Figure 2.5 – Cumulative Abnormal returns around declaration dates [-20; +20]

The use of private information about the future to exercise stock options should show us a stock performance in the long run. Using the whole sample, I measure the stock performance in the post-exercise period using a longer period (around six months after the exercise date).

The result presented in Figure 2.6, does not provide evidence of the use of private information about the future to choose when to exercise the stock options.

The stock prices continue to increase in the post-exercise period. In this case CEOs should have waited to exercise their stock options, it seems that they exercise options when the stock price is high and not based on private information about the future.

Without considering the use of the obtained shares, I cannot conclude about the use of private information to time the stock option exercises.

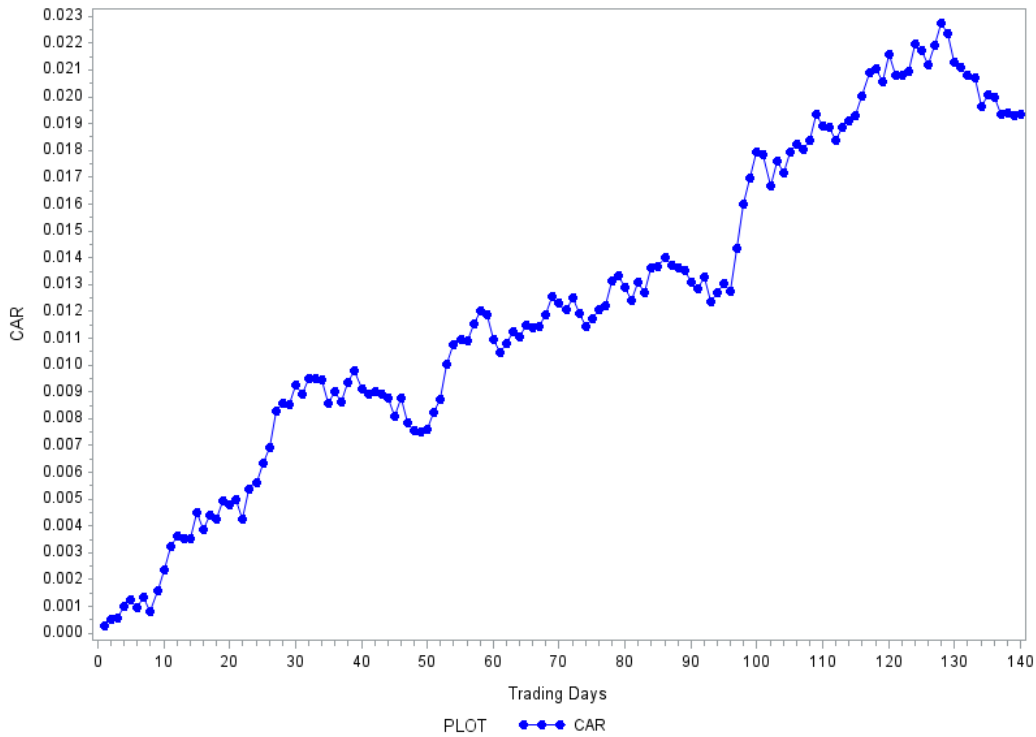

Figure 2.6 – Cumulative Abnormal Returns in the post-exercise period [+1; +140]

b. Use of underlying shares

Figure 2.7 presents the abnormal performance around the exercise dates for subsamples taking into account the use of underlying shares. Abnormal returns are estimated as excess stock returns over market index returns (Model (2.1)).

The result of Figure 2.7 shows that abnormal performance in the pre-exercise period depends on whether the obtained shares are sold or held. When the shares are sold immediately after the exercise date, there is a higher increase in stock prices before the exercise date (CAR[-20; 0] = 2.41 %) without reversal afterwards (CAR[+1; +20] = 0.45 %) than when the shares are held.

This result is not consistent with those of Cicero (2009) and Aboody et al. (2008), who find a negative abnormal performance in the post-exercise period over the short and the long term horizons when CEOs sell the underlying shares. However, the finding of positive abnormal performance in the pre-exercise period and a weak abnormal performance after a stock option exercise followed by the sale of shares is consistent with the insider trading literature, that explains the weak post-sale abnormal performance as the result of insiders' incentives to trade for liquidity and diversification needs.

When the shares are held, the exercises occur after a weaker stock price increase (CAR[-20; -1] = 1.20 %) compared with the increase in the case when CEOs sell the shares (CAR[-20; -1] = 2.42 %), the difference is statistically significant (see Table 2.7).

CEOs who decide to hold shares have to deal between maximizing the value obtained from stock option exercises and minimizing tax payment.

The lower stock prices increase in the pre-exercise period when CEOs exercise the options and hold the shares can be explained by CEO tax minimization incentives. Indeed, when stock options are exercised, the gain from acquisition is highly taxed. CEOs who want to pay less taxes have incentives to exercise at a lower price. By exercising the stock options after a weaker stock price increase, CEOs will lower the taxes they have to pay on the acquisition gain.

In France if shares obtained from exercising stock options are held for at least two years, the acquisition gain will be taxed less, and any subsequent appreciation of the stock (i.e. sales gain) will be taxed at the time of sale as capital gain on security sales at gradual income tax rates. CEOs who hold the shares for at least two years also obtain a tax rebate on the sales gain (50 % or 65 % if the holding period is higher than 8 years). CEOs with positive private information (good news) will choose to exercise stock options and hold shares.This exercise behavior is likely to lead to positive stock performance in the post-exercise period over the long term.

The non null abnormal performance preceding stock option exercises rejects the first hypothesis that the exercise behavior is unrelated to stock price movements. CEOs exercise their stock options and hold shares after a weaker stock price increase because of tax minimization incentives; they sell shares after a higher stock price increase. CEOs thus time their exercises to occur in a favorable date.

At this stage, the results of this study are not inconsistent with the use of private information, however, testing for private information about the future means examining the post-exercise stock performance over the long term. To test whether CEOs use their private information to time stock option exercises and to decide whether to hold or to sell the shares (Hypotheses 2a and 2b), I measure stock performance in the post-exercise period over the following 6 months.

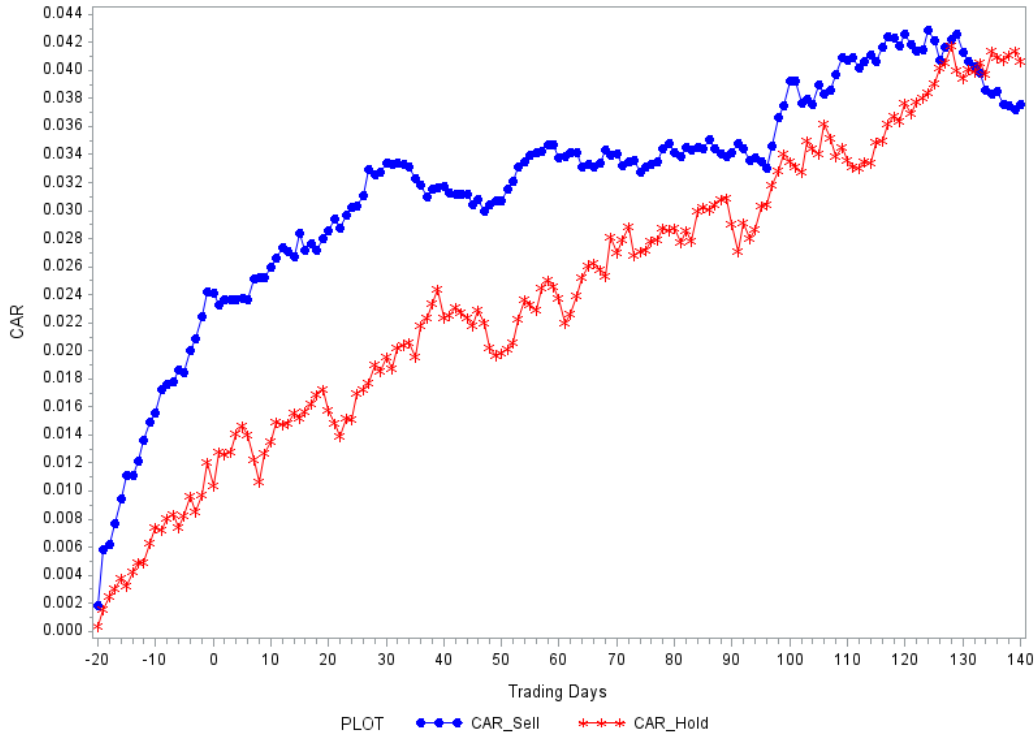

Figure 2.7 – Cumulative Abnormal Returns [-20; +140] with respect to the use of shares.

The right hand side of Figure 2.7 presents the abnormal performance in the 6-month period following the stock option exercises taking into account the use of underlying shares and without controlling for the time left to expiry. Abnormal returns are estimated as the excess stock returns over the market index returns (Model (2.1)).

I find different abnormal performance in the post-exercise period depending on whether the obtained shares are held or not. When the obtained shares are held, the increase in stock prices is higher than when they are sold (CAR[+1; +140] = 3.03 % vs 1.35 %). It seems that CEOs exercise their stock options and hold shares when they expect a larger stock price increase in the future and sell them when they expect a weaker stock price increase. I test for the statistical

significance of the difference between the subsamples (Sale / Holding).

Table 2.7 (Appendix) presents the analysis of abnormal performance (estimated using Model (2.1)) around the exercise dates with respect to the use of underlying shares and time left to expiry. Table 2.7 also presents the results of the test of the statistical significance of difference between subsamples.

The result shows that the post-exercise stock performance of the two subsamples (Sale and Holding) is not significantly different except for the abnormal performance in the 5-day period following the exercises which can be interpreted as the market reaction to the execution of trades. It seems that the market reacts more to the buy order than it does to the sell order. The result presented in Table 2.7 (columns (Sale), (Holding), (Difference)) does not support the hypothesis of the use of private information about the future to choose whether to hold or to sell shares when all exercises are considered.

The absence of statistically significant difference in the post-exercise can be explained by the fact that I do not control for the time left to expiry of the exercised options. As stock options exercised close to expiry are more likely to be driven by expiry and not by private information, I separate these option exercises from those made far from expiry when testing for the use of private information.

c. Time left to expiry

Figure 2.8 presents abnormal performance around the exercise dates for subsamples taking into account the time left to option expiry. Abnormal returns are estimated as excess stock returns over market index returns (Model (2.1)).

The result of Figure 2.8 shows that options exercised far from expiry are made after a stock price increase (CAR[-20; -1]= 2.50 %) and those exercised close to expiry are made after a weak stock price decrease (CAR[-20; -1] = − 0.22 %). The difference between abnormal performance in the pre-exercise period for the two subsamples is statistically significant at 1 % level (result presented in Table 2.7 in the appendix). This pattern is consistent with the fact that stock option exercises made close to expiry are driven by expiry. The result supports the third hypothesis. CEOs will exercise their stock options before losing them. If they had time, CEOs would wait to exercise after a stock price increase.

The result presented by Figure 2.8 thus rejects the first hypothesis too. Stock option exercises made far from expiry seem not to be independent of the stock price movements. When CEOs have time, they exercise their stock options after a stock price increase.

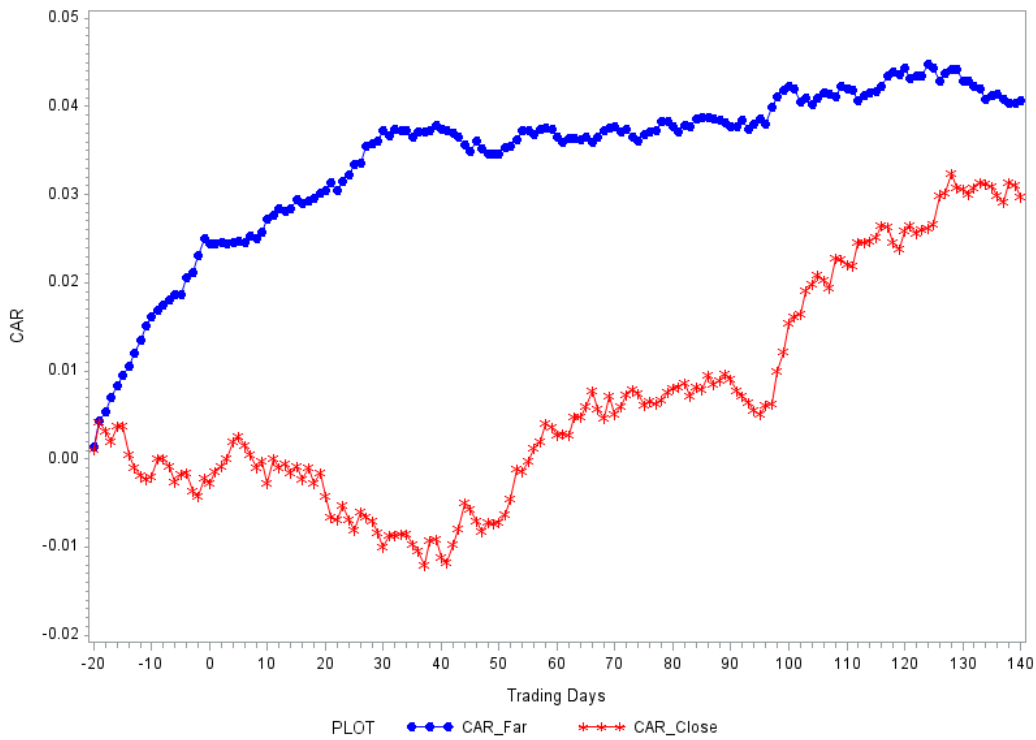

Figure 2.8 – Cumulative Abnormal Returns [-20; +140] with respect to the time left to expiry.

d. Use of the underlying shares and time left to expiry

As a further test for the use private information to time stock option exercises and to decide whether to hold or to sell the shares, I measure abnormal performance in the post-exercise period for the options exercised far from expiry, since options exercised close to expiry are driven by expiry and not by private information (Fig. 2.9). Thus, if I do not control for the time left of options exercises, I conclude, as above, that CEOs exercise their stock options after a stock price increase and not based on private information about the future.

Analyzing the stock performance around stock option exercises made far from expiry (i.e. at least three months before expiry) for the two subsamples with respect to the use of underlying shares, provides evidence of the use of private information about the future when CEOs intend

to hold the shares obtained from the stock option exercises.

Figure 2.9 presents the abnormal performance around option exercises made at least three months before expiry with respect to the use of the underlying shares over the long term (6 months after the exercise dates). This figure shows that CEOs exercise stock options and hold shares when they expect a stock price increase in the post-exercise period over a long horizon (CAR[+1; +140] = 3.46 % for the Holding Subsample versus 0.66 % for the Sale Subsample) which is consistent with private good news. The difference (presented in Table 2.7) is statistically significant at 7 % level.

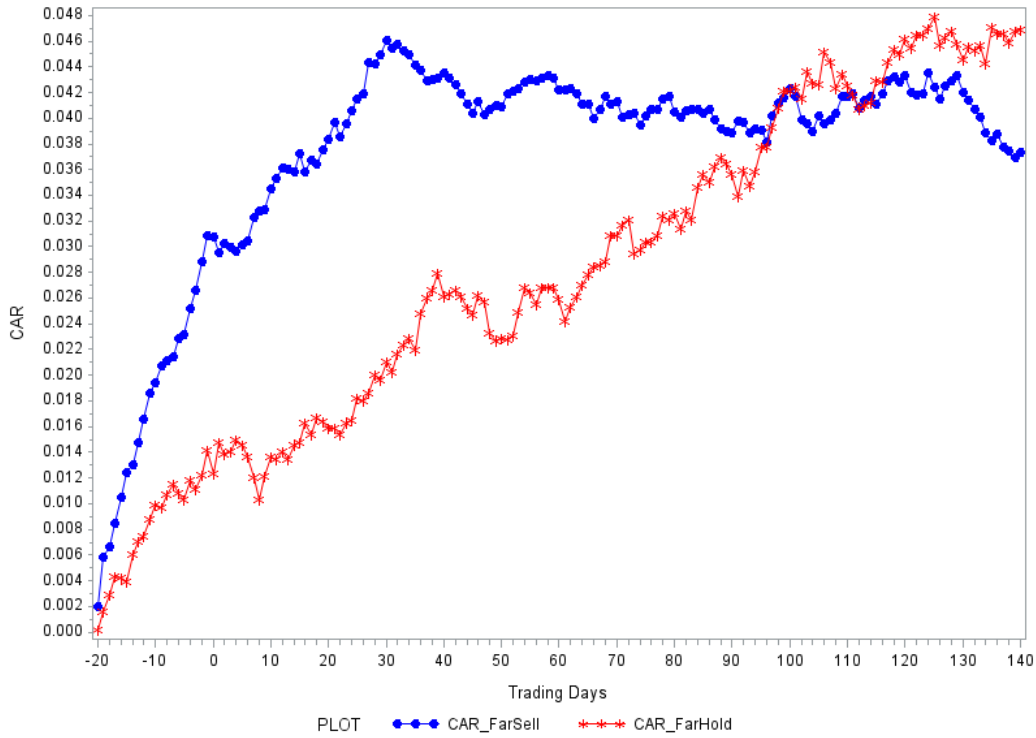

Figure 2.9 – Cumulative Abnormal Returns around option exercises made before expiry.

To measure different abnormal performances following option exercises made Close to/Far from expiry and followed by stock sales or not, I construct four subsamples from the interaction between the time left to expiry and the use of shares. Figure 2.10 presents abnormal performance following stock option exercises with respect to time left to expiry and use of the obtained shares. For option exercises made close to expiry, Figure 2.10 shows a negative abnormal performance following option exercises and stock sales that quickly turns

positive (CAR[+1; +140]_Close Sell = 4.35 %), and a weak positive abnormal performance following exercises and holding of shares (1.09 %). The difference between the two abnormal performances is not statistically significant.

If CEOs had private information, they should have waited to sell the shares since there is a high increase in stock prices when shares are sold immediately after the stock option exercise (4.35 %). Stock option exercise made close to expiry are not driven by private information.

This result supports the second and the third hypotheses. When CEOs exercise their stock options far from expiry, they hold the shares when they have private good news about the future and sell them otherwise. Stock option exercises made close to expiry are driven by expiry and not by private information.

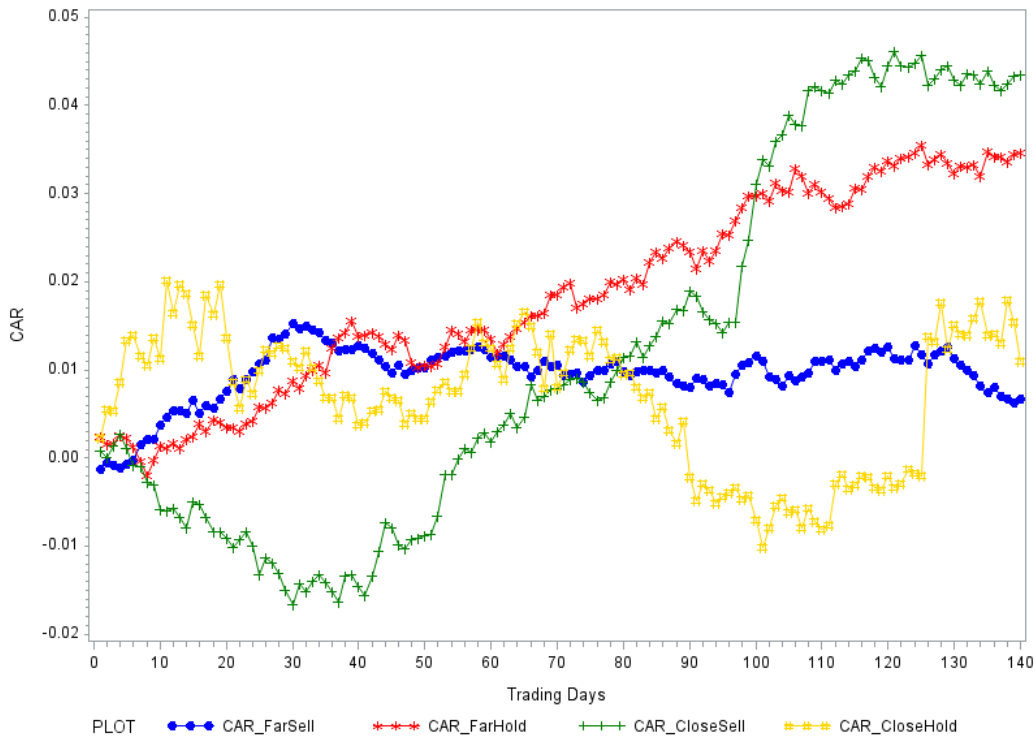

Figure 2.10 – Cumulative Abnormal Returns in the post exercise period.

2.5.4 Information timing of stock option exercises

The results of the event study show that CEOs exercise their stock options after a stock price increase. I examine how favorable the stock price is at the exercise dates compared to the stock

price during the 5 trading days during which CEOs are supposed to report their transactions to the AMF. I compute the maximum stock price 5 days from the exercise date and test whether this maximum stock price is the stock price at the exercise date, then I test for goodness of fit of the obtained probability with 1/5 (i.e. 1 chance over 5 that the stock price at the exercise date is the maximum stock price during the 5-day period).

I take into account all stock option exercises CEOs make on different days and report to the AMF (final sample: 540 exercises).

Results presented in Panel A of Table 2.3 show that the proportion of exercises occurring at a maximum stock price is 24.81 % which is significantly higher than 1/5 (20%). The probability that the stock price at the exercise date is the maximum is 28.61 % (significance at 1%) when the obtained shares are sold shortly after the exercise date.

Cicero (2009) finds that 8.4 % exercises followed by stock sales were backdated after SOX which obliged CEOs to report their transactions to the SEC within 2 trading days of exercise. He finds no difference between pre- and post-SOX backdating behavior when the shares are sold in the market since CEOs are less likely to sell the shares at a higher stock price, he concludes that these exercises were not backdated. In this study, I find that 28.61 % exercises followed by stock sale occur at a maximum stock price, CEOs may wait to sell their shares before reporting their transactions to the AMF. I take into account the stock sales that occur during the 5 trading days in which CEOs must report their exercises.

The new result of this study is that, without time flexibility, CEOs will not time their stock option exercises using information. In contrast, when the stock options are exercised far from expiry, the probability to exercise at the maximum stock price increases to 25.68 % (significance at 1%). Combining time flexibility and stock sales leads to an increase in the probability to exercise at maximum stock price. 29.62 % of stock option exercises made far from expiry and followed by stock sales occur at the maximum stock price, the probability is statistically different from 20 % at 1 % level. This result provides further evidence about the information timing of stock option exercises followed by stock sales.

One can think about backdating stock option exercises followed by stock sales, in France there is no incentive to report an exercise date with a higher stock price since the shares are sold in the market. It is unlikely to find a counterpart that accepts to pay a higher price than the

current market price.

The event study analysis demonstrates different stock price patterns when CEOs hold shares; since they have tax minimization incentives. The study shows that when CEOs hold the obtained shares, stock option exercises occur after a lower stock price increase. CEOs who want to lower the tax payable on the acquisition gain have incentives to report an exercise date with a lower stock price. To test whether CEOs report the date in which the stock price was the lowest, I compute the minimum stock price during the 5-day period following the exercise date during which CEOs have to report their transactions to the AMF.

By choosing an exercise date in which the stock price is low, CEOs pay less taxes on the acquisition gain and if they hold the shares for at least two years, their acquisition gain will be taxed less. The tax rate will be 18 % instead of 30 % for the amount below 152,000 € and 30 % instead of 41 % for the amount of the gain in excess of 152,000 € (this tax rule is applicable to almost all exercises in the final sample). If CEOs hold the shares for at least two years they will also obtain a tax rebate of 50 % on the sales gain which is taxed as capital gain on security sales at gradual income tax rates. So, by exercising options at a lower stock price and holding the shares for at least two years, CEOs lower the taxes payable on the acquisition gain and obtain a tax rebate on the sales gain.

Results presented in Panel B of Table 2.3 show that for 33.69 % exercises not followed by stock sales, CEOs report an exercise date in which the stock price is the lowest (significantly different from 20 % at 1 % level). 34.64 % of stock option exercises made far from expiry and not followed by stock sales occur at the minimum stock price (significantly different from 20 % at 1 % level). 29.41 % of option exercises made close to expiry and not followed by stock sales occur at the minimum stock price, the probability is not statistically different from 20 % which could be due to the size of this subsample.

Cicero (2009) compares how favorable the stock price is at the exercise date when CEOs had up to the 10th day of the following month to report their transactions to the SEC (pre-SOX period) and when the CEOs have to report their transactions within 2 trading day (post-SOX period). He finds that only 7.6 % exercises occur at the lowest stock price when the shares are given back to the company (11.7 % before SOX when CEOs) and 7.1 % when the shares were held by the CEOs (12 % before SOX). He concludes that the stock option exercises were

backdated before SOX when CEOs give the shares to their own companies.

In France, with the reporting rule, the AMF has limited backdating practices but CEOs still dispose of 5 trading days to change their reported exercise date. The results are consistent with backdating when CEOs hold shares. In the event study analysis, I find a positive abnormal performance following exercises and holding of shares which is also consistent with private information especially when the exercises occur far from expiry (CAR[+1;+140]_Hold Far = 3.46 %). I also find that 27.76 % exercises followed by stock sales occur at the minimum stock price; since backdating is not an issue when shares are sold, this result may be due to the fact that CEOs do not have information to time their stock option exercises to occur at a higher price.

The results of this study are consistent with information timing of stock option exercises followed by stock sales and with both backdating and information timing of exercises not followed by stock sales.

Table 2.3 – **Option Exercises that occur at Maximum or Minimum Stock Price.**

This table presents the distribution of the sample and test whether the stock price was the highest (the lowest) during the 5 trading days in which CEOs have to report their transactions to the AMF. The table also presents whether the probability to exercise at maximum (minimum) stock price is statistically different from 20 % (1 over 5). p-values are presented between parentheses.

Panel A: Probability that the stock price at exercise date is the highest (0; +4)				
		Use of underlying shares		
		Sell shares	Hold shares	**Total**
Time to Expiry	Far from Expiry	29.62%***	18.30%	25.68%***
		(< .0001)	(0.5992)	(0.0029)
	Close to Expiry	24.24%	14.71%	21%
		(0.3889)	(0.4403)	(0.8026)
	Total	28.61%***	17.65%	24.81%***
		(< .0001)	(0.4212)	(0.0052)
Panel B: Probability that the stock price at exercise date is the lowest (0; +4)				
		Use of underlying shares		
		Sell shares	Hold shares	**Total**
Time to Expiry	Far from Expiry	29.62%***	34.64%***%	31.36%***
		(< .0001)	(< .0001)	(< .0001)
	Close to Expiry	19.70%	29.41%	23%
		(0.9509)	(0.1701)	(0.4533)
	Total	27.76%***	33.69%***	29.81%***
		(0.0003)	(< .0001)	(< .0001)

2.5.5 Regression

To estimate the relation between abnormal performance in the pre- and post-exercise periods and size of options exercised, the use of obtained shares and the time left to expiry, etc I construct a model using the cumulative abnormal performance of the pre- and post-exercise periods as dependent variables and control variables:

$$CAR_i[-20;-1] = \alpha_0 + \alpha_1 ExerciseSell_{i,t} + \alpha_2 FarExpiry_{i,t} + \alpha_3 \%Size_{i,t} + \alpha_4 Spread_{i,t-1} + \alpha_5 StDev_i + \alpha_6 CEO\_Duality_{i,Y} + \alpha_7 CEO\_LastYear_{i,Y} + \alpha_8 MarketCap_{i,Y-1} + \alpha_9 BM_{i,Y-1} + \alpha_{10} Block_{i,Y} + \varepsilon_{i,t} \quad (2.4)$$

$$CAR_i[+1;+140] = \alpha_0 + \alpha_1 ExerciseSell_{i,t} + \alpha_2 FarExpiry_{i,t} + \alpha_3 \%Size_{i,t} + \alpha_4 St\ Dev_i + \alpha_5 CEO\_Duality_{i,Y} + \alpha_6 CEO\_LastYear_{i,Y} + \alpha_7 MarketCap_{i,Y-1} + \alpha_8 BM_{i,Y-1} + \alpha_9 Block_{i,Y} + \varepsilon_{i,t} \quad (2.5)$$

$ExerciseSell$ is a dummy variable that equals 1 if the underlying shares are sold within 5 trading days of exercise and 0 otherwise. $FarExpiry$ is a dummy variable that equals 1 if the options are exercised at least 3 months before expiry date and 0 otherwise.

$\%Size_{i,t}$ is the natural logarithm of the size of option exercises ($Number\ of\ Options\ \times\ Strike\ Price$) scaled by the total annual compensation. $Spread_{i,t-1}$ is the bid-ask spread one day before the stock option exercise date. This variable captures the relation between stock price and market liquidity. $St\ Dev_i$ is the standard deviation of unadjusted stock prices during a three-month period ending 21 trading days before the exercise date. $CEO\_Duality$ is a dummy variable that equals 1 if the CEO is also the Chairman of the company (in the final sample, 58.5 % of CEOs are also the chairman of the board). $CEO\_LastYear$ is a dummy variable that equals 1 if the CEO is in his last year in position as CEO (in the final sample, 6.2 % of CEOs are on their last year in position as CEO).

As control variables, I use the natural logarithm of the free float part of market capitalization (the whole part is used for robustness checks) measured at the end of the previous fiscal year

and the book-to-market ratio measured at the end of the previous fiscal year.

To control for ownership structure, I use a dummy variable $Block$ that equals 1 if there is a block of shareholders in the company. CEOs of companies with block-holders have less control since these block-holders may actively monitor CEOs and thus prevent them from serving their own interest by either manipulating stock prices or using private information. Only 20% of the companies in the sample have block-holders; CEOs of these companies are those who exercise stock options at least before the last three months and sell the underlying shares.

2.5.6 Regression Results

a. Pre-Exercise Abnormal Performance

To demonstrate the effect of stock option exercises on the pre-exercise abnormal performance, I run a regression of the abnormal performance measured in the pre-exercise period on the use of obtained shares, time to expiry dummy, the size of exercises and other variables (Model (2.4)).

The results of the OLS regression, presented in Table 2.4, show that when options are exercised far from expiry and when the obtained shares are sold, stock option exercises occur after a larger stock price increase compared with the case in which options are exercised close to expiry and when the shares are held ($FarExpiry$ and $ExerciseSell$ are positive and highly significant).

These results confirm the previous ones, when CEOs have time flexibility and when they intend to sell the obtained shares, they time their stock option exercises to occur after a large stock price increase.

In columns (4), (5) and (6) of Table 2.4, I compute the interaction between $FarExpiry$ and $ExerciseSell$. The results show that stock option exercises occur after a larger stock price increase when the options are exercised far from expiry and when the obtained shares are sold than when the shares are held (Far_Sell is positive and significant at 1% level). The intercept which captures the impact of the excluded variable (Far_Hold) is positive and statistically significant indicating a larger increase of stock prices before exercising stock options far from expiry. Stock option exercises made close to expiry occur after a stock price decrease. The difference between coefficient estimates for the interaction variables is reported in Table 2.6 (in

the Appendix).

To take into account the effect of exercise time and for specific firm effects, I run a regression of the model using time and firm fixed effects. The use of these fixed effects does not affect the significance of the main variables: $FarExpiry$ and $ExerciseSell$.

The results of Table 2.4 show that the size of exercises does not impact the stock price in the pre-exercise period. The coefficient on $\%Size$ is negative but not statistically significant. I expected a positive sign for this variable indicating that CEOs who own a large proportion of stock options have higher incentives to exercise at a higher stock price to maximize their gain from stock option exercises.

A high stock price volatility in the preceding three months impacts positively the abnormal performance in the pre-exercise period ($StDevPrices$ is positive and statistically significant) meaning that stocks with high volatility increase shortly before the exercise date. The impact of this variable is no longer significant when controlled for stock liquidity ($Spread$) and for CEO and firm characteristics.

Concerning the variable $Spread$, there is a positive relation between the bid-ask spread and the pre-exercise abnormal stock performance which could be explained by information asymmetry, by a lack of liquidity or by the fact that the exercise size impacts liquidity.

Information asymmetry could be tested using Kyle's Lambda, I leave this question open for future research. To test if the positive relation between the bid-ask Spread and the pre-exercise abnormal performance is due to a lack of liquidity, I compute the interaction between the Spread and the market capitalization; the coefficient is not statistically significant which indicate that there is no lack of general liquidity a few days before the exercise date. Then, to test for the impact of option exercises on liquidity, I compute the interaction between the Spread and the variable $Size$; the interaction is not statistically significant, so there is no evidence on the impact of stock option exercises on liquidity.

The positive relation between the spread and the stock price levels in the pre-exercise period is not due to a lack of liquidity or to the size of CEO trading.

The inclusion of CEO characteristics (column 3) as controls does not significantly affect the results. The dual position of the CEO does not impact the stock prices in the pre-exercise period as well as the fact that the CEO is in his last year in position.

The results are also robust when I control for firm characteristics (using market capitalization and book-to-market ratio in column 3). The results show that the coefficient of market capitalization (free float part) is not statistically significant, this result can be explained by the fact that the sample contains the largest French companies. The use of the whole part of market capitalization gives similar results, the variable is still not statistically significant. The results show that the coefficient of the book-to-market ratio is not statistically significant.

I add, in column (7), a dummy variable that accounts for the presence of block of shareholders as internal control. Because of some missing data, the sample size drops to 480. The result shows that the presence of blocks of shareholders does not impact the stock performance in the pre-exercise period. French companies are mostly controlled by families; Ginglinger and Hamon (2011) find that 71.1 % of French firms are controlled by a single family. However, in the final sample, there are only large and listed companies which are less likely to be family-controlled firms. It would be interesting to investigate whether family ownership affect CEOs' exercise behavior, in future research.

Overall, the results of the regressions using the pre-exercise abnormal performance suggest that CEOs exercise their stock options at a higher stock price when the exercised options are far from expiry and when they intend to sell the obtained shares.

For robustness checks, I follow Petersen (2009) and cluster the standard errors by firm and time. The importance of the time effect is small in the data set; this result is perhaps due to the shortness of the period studied (8 years).

To account for serial correlation and heteroskedasticity, I cluster the standard errors by firm, then compare the results with the White standard errors. Results show that the standard errors clustered by firm (by year) are slightly lower (larger) than the White standard errors. The standard errors clustered by firm and year are almost identical to those clustered just by firm or just by year. In this case clustering standard errors by firm and time is not necessary.

Table 2.4 – **Pre-Exercise Abnormal Performance**

This table presents the OLS regression results using the abnormal performance in the pre- exercise period (CAR[-20; -1]) as dependent variable and independent variables such as: $ExerciseSell$ is a dummy variable that equals 1 if the obtained shares are sold within 5 trading days of exercise and 0 if the shares are held, $FarExpiry$ is a dummy variable that equals 1 if the options are exercised at least three months before the expiry date and 0 otherwise, Far_Sell, $Close\_Sell$ and $Close\_Hold$ are dummy variables obtained from the interaction between $FarExpiry$ and $ExerciseSell$. $\%Size$: natural logarithm of the importance of the size of options exercised relative to the annual compensation of the CEO, $StDev\ Prices$ is the standard deviation of unadjusted stock prices during the 3-month period ending 21 trading days before the exercise date. $CEO\_Duality$ and $CEO\_LastYear$ are dummy variables that equal 1 if the CEO is also the chairman of the company and if the CEO is in his last year in position respectively and 0 otherwise. $MarketCap$ and $Book-to-Market$ are measured at the end of the previous fiscal year. $Block$ is a dummy variable that equals 1 if in the company there is a block of shareholders. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable $CAR[-20;-1]$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Intercept$	-0.01033	-0.01499^{**}	-0.02821	0.01411^{***}	0.00754	-0.00550	-0.0317
	(0.1383)	(0.0484)	(0.1996)	(0.0036)	(0.2222)	(0.7924)	(0.1952)
$ExerciseSell$	0.01235^{**}	0.01418^{***}	0.01349^{***}				0.0150^{***}
	(0.0226)	(0.0092)	(0.0163)				(0.0074)
$FarExpiry$	0.02730^{***}	0.02473^{***}	0.02509^{***}				0.0261^{***}
	($<.0001$)	(0.0002)	(0.0003)				($<.0001$)
$FarExpiry \times ExerciseSell$:							
Far_Sell				0.01673^{***}	0.01775^{***}	0.01685^{***}	
				(0.0052)	(0.0031)	(0.0061)	
$Close\_Sell$				-0.01871^{**}	-0.01379	-0.01478	
				(0.0336)	(0.1206)	(0.1061)	
$Close\_Hold$				-0.01159	-0.01152	-0.01236	
				(0.3057)	(0.3128)	(0.2878)	
$\%Size$		-0.0002	-0.0007		-0.0002	-0.0007	-0.0022
		(0.8871)	(0.6455)		(0.8864)	(0.6446)	(0.2103)
$StDevPrices$		0.00209^{**}	0.00139		0.00204^{**}	0.00136	0.0011
		(0.0216)	(0.1597)		(0.0248)	(0.1688)	(0.2950)
$Spread$			0.04802^{*}			0.04657^{*}	-0.0465
			(0.0657)			(0.0743)	(0.1495)
$CEO\_Duality$			-0.00736			-0.00781	-0.0012
			(0.1876)			(0.1627)	(0.8294)
$CEO\_LastYear$			-0.0003			0.00031	-0.0077
			(0.9790)			(0.9792)	(0.4115)
$MarketCap$			0.00127			0.00132	0.0011
			(0.5611)			(0.5434)	(0.6682)
$Book-to-Market$			0.00914			0.00947	0.0064
			(0.2363)			(0.2199)	(0.3281)
$Block$							0.0051
							(0.4309)
$Adj\ R-Square$	0.0360	0.0402	0.0434	0.0394	0.0421	0.0450	0.0571
N	540	540	540	540	540	540	480

b. Post-Exercise Abnormal Performance

To test for the relation between the exercise decision and the use of private information about the future, I run regressions using the post-exercise abnormal performance ($CAR[+1; +140]$) as the left hand side variable (Model (2.5)). I estimate the relation between the post-exercise abnormal performance and size of options exercised, use of obtained shares, time left to expiry and other variables.

The results presented in Table 2.5 show that the main dummy variables $FarExpiry$ and $ExerciseSell$ are negative but not statistically significant (columns 1 and 2). However, when I control for CEO and firm characteristics (column 3), the variable $ExerciseSell$ become statistically significant at 1% level. It means that CEOs exercise their stock options and sell the obtained shares when they expect a stock price decrease in the future.

The $CEO\_Duality$ dummy variable is negative and statistically significant at 1% level (column 3). Exercises made by CEOs who are also the chairman of the board are followed by a negative abnormal performance. This result is consistent with the fact that CEOs with a dual position have more private information. This result has to be interpreted with caution since the private information (positive or negative) can be used in different ways depending on the use of obtained shares.

The interaction between $FarExpiry$ and $ExerciseSell$ (columns (4), (5) and (6)) shows that for stock option exercises made far from expiry there is a negative stock performance in the post-exercise period when the shares are sold (Far_Sell is negative and statistically significant). I include the result of test for difference in coefficient estimates of the interaction variables in Table 2.6 (in the Appendix). The intercept that captures the effect of Far_Hold variable is positive and highly significant which is consistent with private information. CEOs with private good news will exercise their stock options and hold shares. However, the results show that CEOs with a dual position exercise their stock options and hold shares not based on private information ($CEO\_Duality$ is negative and significant at 1 % level). Maybe these CEOs are the founders of their companies or major shareholders which can explain the fact that they do not use their private information to exercise their stock options. I admit that the corporate governance element is a limit of this study, I leave this question open for future research.

Table 2.5 – **Post-Exercise Abnormal Performance**

This table reports the OLS regression results of the post-exercise abnormal performance (CAR[+1; +140]) on different variables such as: $ExerciseSell$ is a dummy variable that equals 1 if the obtained shares are sold within 5 trading days of exercise and 0 if the shares are held. $FarExpiry$ is a dummy variable that equals 1 if the options are exercised at least three months before the expiry date and 0 otherwise, Far_Sell, $Close\_Sell$ and $Close\_Hold$ are dummy variables obtained from the interaction between $FarExpiry$ and $ExerciseSell$. $\%Size$: natural logarithm of the importance of the size of options exercised relative to the annual compensation of the CEO. $StDev\ Prices$ is the standard deviation of unadjusted stock prices during the 3-month period ending 21 trading days before the exercise date. $CEO\_Duality$ and $CEO\_LastYear$ are dummy variables that equal 1 if the CEO is also the chairman of the company and if the CEO is in his last year in position respectively and 0 otherwise. $MarketCap$ and $Book-to-Market$ are measured at the end of the previous fiscal year. $Block$ is a dummy variable that equals 1 if in the company there is a block of shareholders. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable $CAR[+1;+140]$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Intercept$	0.04353***	0.04924***	0.11300**	0.03458***	0.03876***	0.11408**	0.2224***
	(0.0151)	(0.0121)	(0.0364)	(0.0054)	(0.0152)	(0.0255)	(0.0001)
$ExerciseSell$	− 0.01682	− 0.02125	− 0.03724***				− 0.0342***
	(0.2258)	(0.1297)	(0.0085)				(0.0131)
$FarExpiry$	− 0.01621	− 0.01682	− 0.00639				− 0.0143
	(0.3406)	(0.3314)	(0.7108)				(0.3331)
$FarExpiry \times ExerciseSell$:							
Far_Sell				− 0.02794*	− 0.03154**	− 0.04616***	
				(0.0689)	(0.0410)	(0.0029)	
$Close\_Sell$				0.00894	0.00491	− 0.02245	
				(0.6918)	(0.8303)	(0.3285)	
$Close\_Hold$				− 0.02367	− 0.02125	− 0.02676	
				(0.4152)	(0.4706)	(0.3552)	
$\%Size$		− 0.00522	− 0.00438		− 0.00522	− 0.00431	− 0.0054
		(0.2085)	(0.2895)		(0.2081)	(0.2967)	(0.1717)
$StDevPrices$		− 0.00432*	− 0.00451**		− 0.00418*	− 0.00438**	− 0.0046***
		(0.0651)	(0.0497)		(0.0742)	(0.0566)	(0.0178)
$CEO\_Duality$			− 0.07318***			− 0.07195***	− 0.0412***
			(< .0001)			(< .0001)	(0.0059)
$CEO\_LastYear$			− 0.03943			− 0.04113	− 0.0384
			(0.1903)			(0.1718)	(0.1681)
$MarketCap$			− 0.00181			− 0.00205	− 0.0148***
			(0.7368)			(0.7025)	(0.0130)
$Book-to-Market$			0.00697			0.00597	− 0.0193
			(0.7196)			(0.7582)	(0.3735)
$Block$							0.0353**
							(0.0240)
$Adj\ R-Square$	0.0007	0.0068	0.0548	0.0041	0.0097	0.0566	0.09272
N	540	540	540	540	540	540	480

The size of exercise does not impact the future abnormal stock performance, $\%Size$ is negative but not statistically significant. High stock price volatility in the 3 months ending 21 days before the exercise date is negatively related to the post-exercise abnormal performance ($StDevPrices$ is negative and significant at 10 % level).

In column (7) I control for ownership structure. I add a dummy variable that equals 1 if there exists a block of shareholders in the company. The result indicates that the existence of block-holders enhance the stock performance following stock option exercises. Companies with block-holders enjoy a higher stock returns than the other companies.

Overall the results of this study show that CEOs who expect a poor stock performance will exercise stock options and sell the obtained shares when they have time flexibility. This result is consistent with private bad news.

2.6 Robustness checks

One can argue that the abnormal performance observed around the exercise dates is caused by the market. To check this question, I compute a cumulative stock return and a cumulative market return around the exercise date.

Figure 2.11 presents the results of the cumulative stock and market returns.

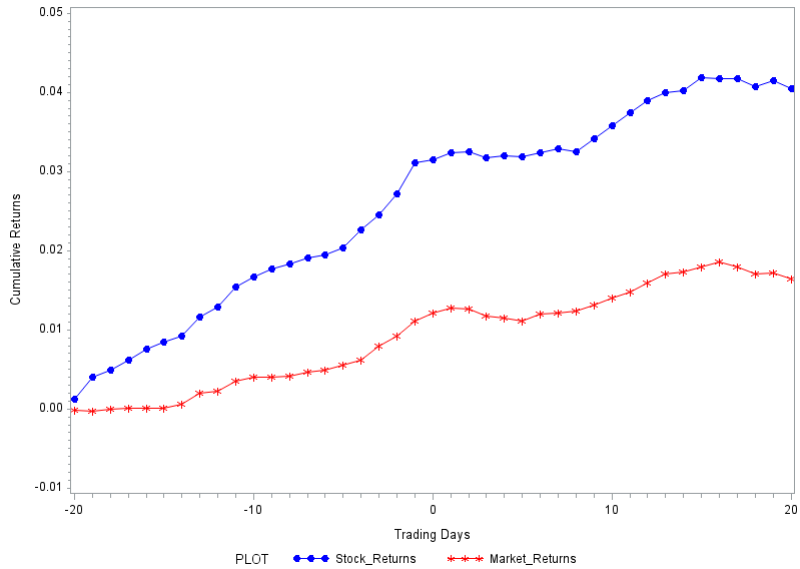

Figure 2.11 – Cumulative Stock and Market returns around exercise dates [-20; +20]

The results of Figure 2.11 show that the abnormal performance around the exercise dates is due to stock movements and not to market movements; market returns are close to zero during the exercise period.

The difference between stock returns and market return increases a few days before the exercise dates. This result is consistent with the use of private information which attributes abnormal performance to the stock and not to a general market trend.

To test for the robustness of the results, I estimate the abnormal returns using two other models (2.2) and (2.3). I compute the β using an estimation period of one year ending 40 trading days before each exercise date. The results presented in Tables 2.8 and 2.9 show that stock option exercises made far from expiry are driven by private information about the future. The results are robust to the adjustment for stock betas.

Figure 2.12 presents the abnormal performance estimated using Model (2.2). It shows almost the same pattern as before. Stock options exercised far from expiry and followed by stock holding are made based on private good news (CAR[+1; +140]_FarHold = 4.69 % vs CAR[+1; +140]_FarSell = 1.03 %).

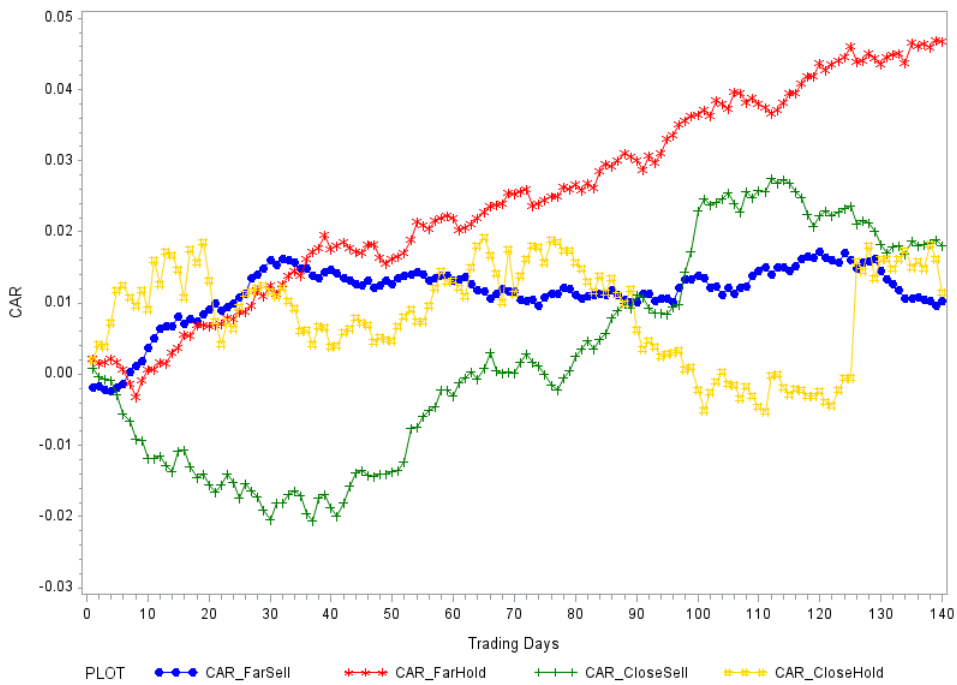

Figure 2.12 – Cumulative Abnormal Returns after stock option exercises (Mode(2.2)).

The options exercised close to expiry are driven by expiry, CEOs who need liquidity sell the shares. There is no significant difference in the post-exercise stock performance when stock options are exercised close to expiry.

I also estimate the abnormal returns using Model (2.3). I compute the daily risk free rate from the OECD country-specific short-term interest rate for France, then I estimate the abnormal returns around CEO stock option exercises. The result shown in Figure 2.13 confirms the previous result. Overall, CEOs exercise their stock options and hold the shares when they expect a good stock performance; they sell shares when they expect a bad performance.

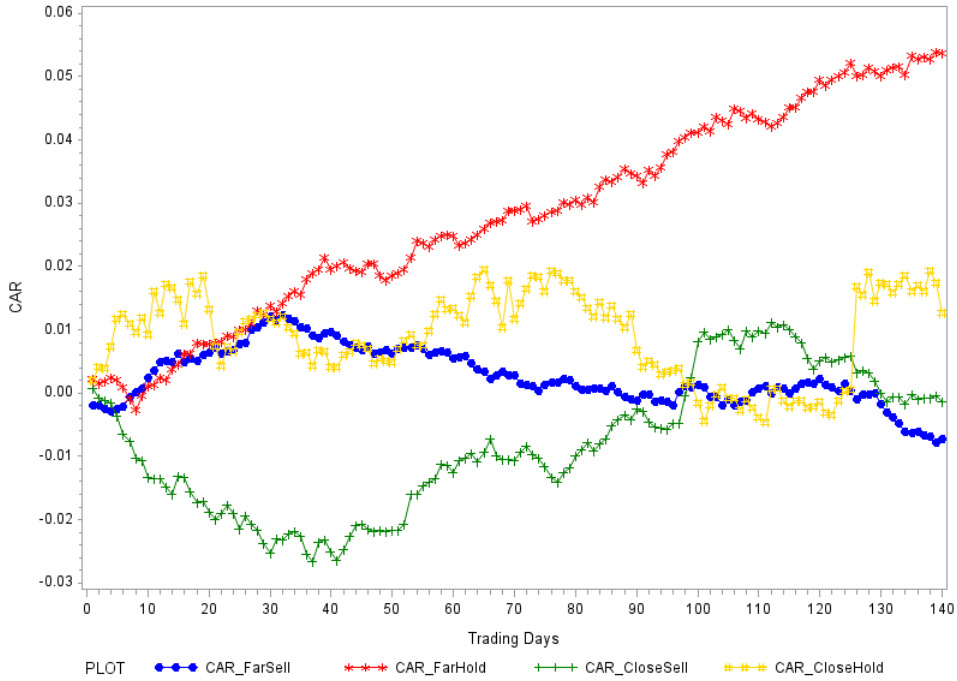

Figure 2.13 – Cumulative Abnormal Returns after stock option exercises (Model(2.3)).

2.7 Conclusion and further research

In this chapter, I analyze the stock option exercise behavior of CEOs in the most important French companies; I then investigate whether the stock option exercises are driven by expiry, by private information about the future.

The results of this chapter show that stock options are exercised in most cases during the last year before expiry (43.7 %), about 18.5 % of option exercises occur during the last three

months before expiry and only 2.4 % (12.7 %) of exercises occur during the first month (year) of vesting.

I find that in aggregate stock option exercises occur after a stock price increase. Separating the sample into subsamples regarding the use of obtained shares, I find that stock option exercises followed by immediate sales are preceded by a positive abnormal performance and followed by a weaker positive abnormal performance over short-term horizon. Exercises followed by no immediate sales are preceded by a weaker positive abnormal performance consistent with tax minimization incentives, and followed by positive abnormal performance.

Considering the time left of expiry of the exercised options. I find that option exercises occur after a stock price increase when these options are exercised at least before the three-month period preceding the expiry date. Furthermore, when stock options are exercised close to the expiry date (i.e. during the last three months before expiry), CEOs do not have time flexibility to choose the exercise time. I conclude that the exercises that occur close to expiry dates are driven by expiry and not by private information.

To test for the use of private information about the future, I analyze stock performance during the 6-month period following the exercises. Considering the whole sample the result does not provide evidence about the use of private information about the future to choose the appropriate exercise time and to decide whether to hold or to sell the obtained shares. Nevertheless, taking into account only the exercises that are less likely to be driven by option expiry (i.e. exercises that occur before the last three months before expiry) provides evidence about the use of private information about the future. I find that CEOs exercise stock options and hold shares when they expect a positive abnormal performance in the future and they sell shares when they expect a weaker abnormal performance. I find a weaker evidence about the use of private information to exercise stock options and hold or sell the obtained shares by CEOs who are also the chairman of their board. The corporate governance issue should be addressed in future research.

CEOs have 5 trading days to report their transactions to the AMF; I compute how favorable the stock price is at the exercise date compared to the stock price during these 5 trading days. I find that 28.61 % followed by stock sales occur at maximum stock price which is consistent with information timing of stock option exercises and not with backdating since CEOs cannot

find a counterpart in the market that accepts to pay a higher price than the market price.

For option exercises not followed by stock sales, I find 33.69 % exercises that occur at the minimum stock price. This result is consistent with backdating of stock option exercises not followed by sales. CEOs may report an exercise date in which the stock price was lower in order to pay less tax on acquisition gains. From the event study, I find a positive abnormal performance following these exercises that are not followed by immediate sales which is consistent with the use of private information. The results of this chapter are consistent with information timing of option exercises followed by stock sales and with both backdating and information timing of exercises not followed by stock sales.

The results of this chapter raise several questions for future research. The most important are: what is the cause of the stock price movements around stock option exercises? Is it the result of the timing of voluntary or mandatory disclosures around option exercises? Do CEOs manipulate stock prices before exercising stock options? Do CEOs release more good news before to exercise their stock options? These questions are just as relevant to understand the sources of stock price movements around CEO stock option exercises as observed in this empirical study. Indeed, the stock performance observed in the pre-exercise period suggests a manipulation of stock price levels by CEOs.

2.8 Appendices

A. Abnormal trading volume around stock option exercises

To test whether the stock price movements around stock option exercises are related to trading volume and to control for stock liquidity, I compute the abnormal turnover by volume around exercise dates. Following Chae (2005), I compute the abnormal turnover by volume as the difference between the (log) turnover by volume around the exercise dates and the average (log) turnover in the pre-exercise period (-40; -21). Then, I accumulate the average abnormal turnover by volume around the exercise dates (-20; +20).

$$Turnover\ by\ Volume_{i,t} = Log(\frac{Trading\ Volume_{i,t}}{Shares\ Outstanding_{i,t}})$$
$$Abnormal\ Turnover\ by\ Volume_{i,t} =$$
$$Turnover\ by\ Volume_{i,t} - \frac{1}{20}\sum_{T=-40}^{-21} Turnover\ by\ Volume_{i,T}$$

Figure 2.14 shows the cumulative abnormal turnover around CEO stock option exercises.

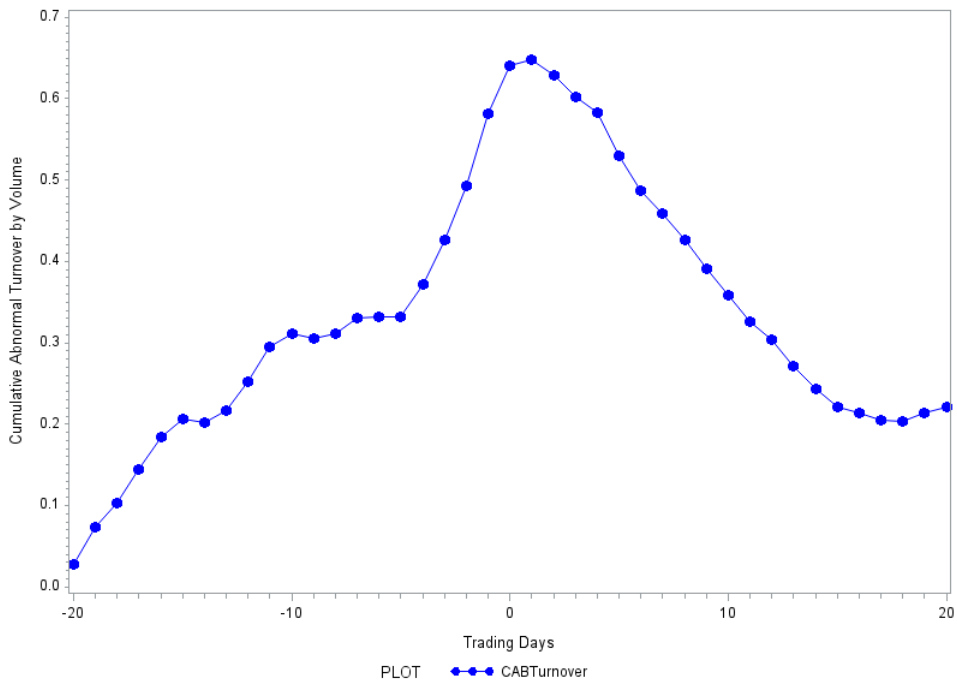

Figure 2.14 – Cumulative Abnormal Turnover by Volume around stock option exercises.

There is an increase of abnormal turnover in the pre-exercise period (an increase of 0.58 from -20 to -1, significant at 1 % level). The abnormal turnover by volume start to decrease shortly after the stock option exercises (non significant decrease of - 0.40 from +1 to +20).

Before scheduled announcements, Chae (2005) finds a significant decrease in abnormal trading volume because of the trading activity of uninformed investors who trade less when they expect high trading demand from informed investors. This explanation is not applicable to stock option exercises because there is no information about the exercise decision of CEOs before they report their exercises to the AMF (the announcements of stock option exercises are not scheduled in advance).

Table 2.6 – **Differences between Coefficient Estimates**

This table presents the results of tests for the difference in coefficient estimates for the interaction between the two dummy variables $FarExpiry$ and $ExerciseSell$ in the regressions of Pre-Exercise Abnormal Performance ($CAR[-20;-1]$) and Post-Abnormal Performance ($CAR[+1;+140]$). p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

			Dependent Variables	
$FarExpiry$	$\times$	$ExerciseSell$	$CAR[-20;-1]$	$CAR[+1;+140]$
$Close\ Sell$	v.s	$Close\ Hold$	-0.00712	0.03262
			(0.5720)	(0.3134)
$Close\ Sell$	v.s	$Far\ Sell$	-0.03544^{***}	0.03688^{*}
			$(< .0001)$	(0.0782)
$Close\ Sell$	v.s	$Far\ Hold$	-0.01871^{**}	0.00894
			(0.0336)	(0.6918)
$Close\ Hold$	v.s	$Far\ Sell$	-0.02832^{***}	0.004269
			(0.0091)	(0.8779)
$Close\ Hold$	v.s	$Far\ Hold$	-0.01159	-0.02367
			(0.3057)	(0.4152)
$Far\ Sell$	v.s	$Far\ Hold$	0.01673^{***}	-0.02794^{*}
			(0.0052)	(0.0689)

Table 2.7 – **Cumulative Abnormal Returns around stock option exercises (Model (2.1)).**

This table presents the cumulative abnormal returns around the exercise dates estimated using Model (2.1) for the whole sample and for subsamples with respect to the use of underlying shares and the time left to expiry. It presents the test of the statistical significance of difference in abnormal performance in the pre- and post-exercise periods between the subsamples. p-values are presented between parentheses.

		Use of underlying shares			**Time left to Expiry**			**Far from Expiry**			**Close to Expiry**		
	All Exercises	Sale Subsample	Holding Subsample	**Difference**	Close Subsample	Far Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**
CAR[-20; -1]	2.00 %	2.42 %	1.20 %	1.22 %	-0.22 %	2.50 %	-2.72 %	3.08 %	1.41 %	1.67 %	-0.46 %	0.25 %	-0.71 %
	(<.0001)	(<.0001)	(0.0034)	(0.0263)	(0.6693)	(<.0001)	(<.0001)	(<.0001)	(0.0020)	(0.0068)	(0.4508)	(0.7871)	(0.5091)
CAR[-10; -1]	0.81 %	0.93 %	0.58 %	0.35 %	0.01 %	0.99 %	-0.97 %	1.23 %	0.53 %	0.69 %	-0.38 %	0.77 %	-1.14 %
	(<.0001)	(<.0001)	(0.0612)	(0.3501)	(0.9760)	(<.0001)	(0.0343)	(<.0001)	(0.1230)	(0.0985)	(0.4365)	(0.2583)	(0.1683)
CAR[-5; -1]	0.53 %	0.56 %	0.46 %	0.10 %	0.04 %	0.64 %	-0.59 %	0.80 %	0.34 %	0.46 %	-0.47 %	1.04 %	-1.51 %
	(0.0001)	(0.0005)	(0.0703)	(0.7347)	(0.8906)	(<.0001)	(0.0911)	(<.0001)	(0.2341)	(0.1484)	(0.1656)	(0.0926)	(0.0194)
CAR[-1; +1]	0.16 %	0.08 %	0.31 %	-0.22 %	0.28 %	0.13 %	0.14 %	0.07 %	0.26 %	-0.19 %	0.15 %	0.52 %	-0.38 %
	(0.1177)	(0.4976)	(0.0963)	(0.3029)	(0.2885)	(0.2279)	(0.5932)	(0.6174)	(0.1751)	(0.4213)	(0.5933)	(0.3428)	(0.4925)
CAR[+1; +5]	0.13 %	-0.03 %	0.42 %	-0.45 %	0.53 %	0.04 %	0.49 %	-0.06 %	0.22 %	-0.28 %	0.11 %	1.34 %	-1.23 %
	(0.3164)	(0.8359)	(0.0697)	(0.0868)	(0.0942)	(0.7963)	(0.1304)	(0.7171)	(0.3349)	(0.3289)	(0.6790)	(0.0852)	(0.0607)
CAR[+1; +10]	0.24 %	0.19 %	0.31 %	-0.12 %	0.00 %	0.29 %	-0.29 %	0.37 %	0.13 %	0.24 %	-0.58 %	1.13 %	-1.72 %
	(0.1496)	(0.3014)	(0.3154)	(0.7313)	(0.9998)	(0.1132)	(0.4921)	(0.0816)	(0.7004)	(0.5244)	(0.1206)	(0.1548)	(0.0261)
CAR[+1; +20]	0.48 %	0.45 %	0.53 %	-0.09 %	-0.14 %	0.62 %	-0.76 %	0.76 %	0.35 %	0.41 %	-0.92 %	1.36 %	-2.28 %
	(0.0347)	(0.0710)	(0.2427)	(0.8558)	(0.7517)	(0.0165)	(0.1899)	(0.0085)	(0.4899)	(0.4465)	(0.0228)	(0.2033)	(0.0159)
CAR[+1; +60]	1.09 %	0.97 %	1.33 %	-0.37 %	0.55 %	1.22 %	-0.67 %	1.14 %	1.35 %	-0.21 %	0.19 %	1.25 %	-1.06 %
	(0.0177)	(0.0788)	(0.1106)	(0.7027)	(0.4948)	(0.0231)	(0.5713)	(0.0732)	(0.1640)	(0.8518)	(0.8466)	(0.3899)	(0.5330)
CAR[+1; +100]	1.79 %	1.52 %	2.31 %	-0.79 %	1.82 %	1.79 %	0.03 %	1.15 %	2.97 %	-1.82 %	3.11 %	-0.70 %	3.81 %
	(0.0014)	(0.0324)	(0.0122)	(0.5036)	(0.0690)	(0.0062)	(0.9832)	(0.1627)	(0.0051)	(0.1818)	(0.0122)	(0.6760)	(0.0674)
CAR[+1; +140]	1.93 %	1.35 %	3.03 %	-1.67 %	3.24 %	1.64 %	1.61 %	0.66 %	3.46 %	-2.79 %	4.35 %	1.09 %	3.26 %
	(0.0036)	(0.0977)	(0.0078)	(0.2280)	(0.0292)	(0.0274)	(0.3447)	(0.4631)	(0.0074)	(0.0716)	(0.0225)	(0.6448)	(0.2941)
Nb OBS	540	353	187		100	440		287	153		66	34	

Table 2.8 – **Cumulative Abnormal Returns around stock option exercises (Model (2.2)).**

This table presents the cumulative abnormal returns around option exercises estimated using Model (2.2) for the whole sample and for subsamples with respect to the use of underlying shares and the time left to expiry. It presents the test of the statistical significance of difference in abnormal performance in the pre- and post-exercise periods between the subsamples. p-values are presented between parentheses.

		Use of underlying shares			**Time left to Expiry**			**Far from Expiry**			**Close to Expiry**		
	All Exercises	Sale Subsample	Holding Subsample	**Difference**	Close Subsample	Far Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**
CAR[-20; -1]	2.03 %	2.43 %	1.28 %	1.15 %	-0.02 %	2.49 %	-2.51 %	3.04 %	1.47 %	1.57 %	-0.24 %	0.42 %	-0.66 %
	(<.0001)	(<.0001)	(0.0012)	(0.0294)	(0.9735)	(<.0001)	(<.0001)	(<.0001)	(0.0007)	(0.0081)	(0.6609)	(0.6674)	(0.5228)
CAR[-10; -1]	0.82 %	0.93 %	0.59 %	0.34 %	0.15 %	0.97 %	-0.82 %	1.19 %	0.55 %	0.63 %	-0.16 %	0.75 %	-0.92 %
	(<.0001)	(<.0001)	(0.0496)	(0.3447)	(0.6937)	(<.0001)	(0.0658)	(<.0001)	(0.0977)	(0.1199)	(0.7144)	(0.2818)	(0.2497)
CAR[-5; -1]	0.58 %	0.63 %	0.49 %	0.13 %	0.23 %	0.66 %	-0.43 %	0.81 %	0.37 %	0.44 %	-0.18 %	1.03 %	-1.21 %
	(<.0001)	(<.0001)	(0.0542)	(0.6293)	(0.4371)	(<.0001)	(0.2125)	(<.0001)	(0.1872)	(0.1569)	(0.5900)	(0.0912)	(0.0554)
CAR[-1; +1]	0.15 %	0.11 %	0.23 %	-0.12 %	0.28 %	0.12 %	0.15 %	0.09 %	0.18 %	-0.09 %	0.18 %	0.46 %	-0.28 %
	(0.1206)	(0.3398)	(0.2011)	(0.5591)	(0.2515)	(0.2488)	(0.5397)	(0.4701)	(0.3445)	(0.7022)	(0.4779)	(0.3703)	(0.5889)
CAR[+1; +5]	-0.02 %	0.33 %	-0.21 %	0.54 %	0.21 %	-0.07 %	0.29 %	-0.19 %	0.15 %	-0.34 %	-0.28 %	1.17 %	-1.46 %
	(0.8704)	(0.1381)	(0.1729)	(0.0417)	(0.4928)	(0.5956)	(0.3805)	(0.2823)	(0.5071)	(0.2473)	(0.2944)	(0.1139)	(0.0245)
CAR[+1; +10]	0.12 %	0.19 %	0.08 %	0.11 %	-0.47 %	0.25 %	-0.72 %	0.37 %	0.03 %	0.34 %	-1.18 %	0.92 %	-2.10 %
	(0.4743)	(0.5319)	(0.6812)	(0.7526)	(0.2403)	(0.1642)	(0.0891)	(0.0837)	(0.9374)	(0.3620)	(0.0085)	(0.2302)	(0.0111)
CAR[+1; +20]	0.56 %	0.77 %	0.44 %	0.32 %	-0.58 %	0.81 %	-1.39 %	0.90 %	0.65 %	0.26 %	-1.55 %	1.31 %	-2.87 %
	(0.0131)	(0.0864)	(0.0736)	(0.4900)	(0.2068)	(0.0014)	(0.0153)	(0.0016)	(0.1931)	(0.6299)	(0.0002)	(0.2122)	(0.0025)
CAR[+1; +60]	1.36 %	2.03 %	1.01 %	1.02 %	0.25 %	1.62 %	-1.37 %	1.31 %	2.18 %	-0.87 %	-0.31 %	1.32 %	-1.63 %
	(0.0023)	(0.0137)	(0.0556)	(0.2767)	(0.7775)	(0.0016)	(0.2315)	(0.0286)	(0.0219)	(0.4158)	(0.7739)	(0.3714)	(0.3739)
CAR[+1; +100]	2.04 %	2.95 %	1.55 %	1.40 %	1.44 %	2.17 %	-0.73 %	1.38 %	3.66 %	-2.27 %	2.30 %	-0.22 %	2.52 %
	(0.0002)	(0.0012)	(0.0251)	(0.2251)	(0.1370)	(0.0007)	(0.6049)	(0.0881)	(0.0004)	(0.0888)	(0.0502)	(0.8993)	(0.2168)
CAR[+1; +140]	2.17 %	4.05 %	1.17 %	2.87 %	1.58 %	2.30 %	-0.73 %	1.03 %	4.69 %	-3.67 %	1.80 %	1.14 %	0.66 %
	(0.0007)	(0.0004)	(0.1242)	(0.0311)	(0.2228)	(0.0016)	(0.6574)	(0.2403)	(0.0003)	(0.0156)	(0.2240)	(0.6533)	(0.8092)
Nb OBS	540	353	187		100	440		287	153		66	34	

Table 2.9 – **Cumulative Abnormal Returns around stock option exercises (Model (2.3)).**

This table presents the cumulative abnormal returns around stock option exercises estimated using Model (2.3) for the whole sample and for subsamples with respect to the use of underlying shares and the time left to expiry. It presents the test of the statistical significance of difference in abnormal performance in the pre- and post-exercise periods between the subsamples. p-values are presented between parentheses.

		Use of underlying shares			**Time left to Expiry**			**Far from Expiry**			**Close to Expiry**		
	All Exercises	Sale Subsample	Holding Subsample	**Difference**	Close Subsample	Far Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**	Sale Subsample	Holding Subsample	**Difference**
CAR[-20; -1]	1.88 %	2.16 %	1.37 %	0.79 %	-0.23 %	2.37 %	-2.60 %	2.79 %	1.58 %	1.21 %	-0.57 %	0.42 %	-1.00 %
	(<.0001)	(<.0001)	(0.0007)	(0.1351)	(0.6350)	(<.0001)	(<.0001)	(<.0001)	(0.0003)	(0.0418)	(0.2949)	(0.6709)	(0.3383)
CAR[-10; -1]	0.74 %	0.80 %	0.64 %	0.16 %	0.04 %	0.91 %	-0.87 %	1.06 %	0.61 %	0.45 %	-0.33 %	0.76 %	-1.09 %
	(<.0001)	(0.0002)	(0.0335)	(0.6579)	(0.9174)	(<.0001)	(0.0512)	(<.0001)	(0.0665)	(0.2697)	(0.4635)	(0.2816)	(0.1756)
CAR[-5; -1]	0.54 %	0.56 %	0.52 %	0.04 %	0.18 %	0.63 %	-0.45 %	0.75 %	0.40 %	0.35 %	-0.26 %	1.03 %	-1.29 %
	(<.0001)	(0.0003)	(0.0420)	(0.8765)	(0.5520)	(<.0001)	(0.1876)	(<.0001)	(0.1518)	(0.2620)	(0.4298)	(0.0901)	(0.0406)
CAR[-1; +1]	0.13 %	0.07 %	0.25 %	-0.18 %	0.25 %	0.10 %	0.14 %	0.06 %	0.20 %	-0.14 %	0.13 %	0.46 %	-0.33 %
	(0.1816)	(0.5455)	(0.1720)	(0.3939)	(0.3112)	(0.3280)	(0.5744)	(0.6702)	(0.2964)	(0.5275)	(0.6048)	(0.3689)	(0.5226)
CAR[+1; +5]	-0.06 %	-0.28 %	0.36 %	-0.63 %	0.16 %	-0.11 %	0.26 %	-0.25 %	0.17 %	-0.43 %	-0.37 %	1.18 %	-1.54 %
	(0.6563)	(0.0717)	(0.1102)	(0.0172)	(0.6085)	(0.4473)	(0.4173)	(0.1519)	(0.4244)	(0.1399)	(0.1774)	(0.1130)	(0.0174)
CAR[+1; +10]	0.04 %	-0.05 %	0.23 %	-0.29 %	-0.57 %	0.18 %	-0.76 %	0.24 %	0.08 %	0.16 %	-1.34 %	0.92 %	-2.27 %
	(0.7850)	(0.7780)	(0.4358)	(0.4038)	(0.1600)	(0.2985)	(0.0715)	(0.2552)	(0.8077)	(0.6621)	(0.0038)	(0.2325)	(0.0073)
CAR[+1; +20]	0.41 %	0.18 %	0.85 %	-0.67 %	-0.79 %	0.68 %	-1.47 %	0.65 %	0.74 %	-0.10 %	-1.88 %	1.32 %	-3.20 %
	(0.0708)	(0.4793)	(0.0620)	(0.1574)	(0.0939)	(0.0077)	(0.0113)	(0.0236)	(0.1408)	(0.8584)	(<.0001)	(0.2145)	(0.0009)
CAR[+1; +60]	0.93 %	0.21 %	2.27 %	-2.06 %	-0.37 %	1.22 %	-1.59 %	0.55 %	2.48 %	-1.92 %	-1.26 %	1.35 %	-2.61 %
	(0.0447)	(0.6923)	(0.0082)	(0.0332)	(0.6811)	(0.0205)	(0.1786)	(0.3657)	(0.0128)	(0.0809)	(0.2644)	(0.3809)	(0.1735)
CAR[+1; +100]	1.33 %	0.25 %	3.36 %	-3.11 %	0.48 %	1.53 %	-1.05 %	0.13 %	4.15 %	-4.02 %	0.81 %	-0.16 %	0.97 %
	(0.0219)	(0.7227)	(0.0006)	(0.0105)	(0.6249)	(0.0244)	(0.4838)	(0.8799)	(0.0002)	(0.0045)	(0.4757)	(0.9338)	(0.6421)
CAR[+1; +140]	1.21 %	-0.61 %	4.64 %	-5.25 %	0.34 %	1.41 %	-1.06 %	-0.72 %	5.39 %	-6.11 %	-0.13 %	1.27 %	-1.40 %
	(0.0766)	(0.4449)	(0.0002)	(0.0002)	(0.7978)	(0.0720)	(0.5451)	(0.4374)	(0.0001)	(0.0002)	(0.9260)	(0.6556)	(0.6219)
Nb OBS	540	353	187		100	440		287	153		66	34	

Chapter 3

CEO Stock Option Exercises and Earnings Announcements

ABSTRACT

This chapter tests whether CEOs in the largest French companies release more good news in the annual earnings announcements when they have to exercise their stock options. I find a higher likelihood of good news announcements when the options are exercised close to expiry which is consistent earnings manipulation. I also find a higher likelihood of positive earnings announcements when CEOs exercise their options close to expiry and sell the obtained shares. I then examine the timing of earnings announcements. The results show that companies accelerate earnings announcements when CEOs exercise their stock options shortly after those announcements, especially when the options are exercised close to expiry and when the obtained shares are sold. Finally, I investigate the relation between the incentives given by stock option exercises made close to expiry and the level of accruals. The results show that a high exercise gain leads to a higher level of discretionary accruals.

RÉSUMÉ

Ce chapitre teste si les dirigeants des plus grandes entreprises françaises annoncent plus de bonnes nouvelles dans les résultats annuels quand ils doivent exercer leurs options. Les résultats montrent une plus forte probabilité d'annonces de bonnes nouvelles lorsque les options sont exercées à expiration, ce qui est cohérent avec la manipulation des résultats. La probabilité d'annonces de résultats positifs est également plus élevée lorsque les dirigeants exercent leurs options et revendent les actions obtenues. Ensuite, le calendrier des annonces de résultats est examiné. Les résultats montrent que les entreprises ont tendance à accélérer les annonces lorsque les dirigeants exercent leurs options à expiration peu de temps après les annonces, en particulier lorsque les actions obtenues sont revendues. Enfin, la relation entre les incitations données par les exercice d'options et le niveau des Accruals est étudiée. Les résultats montrent qu'un gain d'exercice élevé conduit à un niveau plus élevé d'Accruals discrétionnaires.

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3.1 Introduction

Stock option compensation represents a large part of CEO total compensation. Companies use this type of compensation to mitigate agency problems between shareholders and managers. However, previous studies find that CEOs (and other executives) behave opportunistically in order to increase their own profits. CEOs use their private information when they exercise their stock options (Aboody et al. (2008)). Some CEOs manipulate the reporting date of stock option exercises "Backdating" (Cicero (2009), Bartov and Mohanram (2004)). [1] Other CEOs time stock option awards to occur shortly before or after earnings announcements (Yermack (1997)) or they use voluntary disclosures to reduce stock prices before they receive stock options (Aboody and Kasznick (2000), Chauvin and Shenoy (2001)). CEOs delay the disclosure of good news and rush forward that of bad news. With this disclosure strategy, CEOs decrease the stock prices before stock option awards in order to receive stock options with a low exercise price. Some CEOs use their voluntary disclosures around stock option exercises (Brockman et al. (2010)). Others use more accruals when they have stock based compensation which create higher incentives to manage earnings (Bergstresser and Philippon (2006), Hribar and Collins (2002) and Gopalan et al. (2014)).

CEOs may be tempted to increase earnings before to exercise their stock options in order to increase their exercise gains. This research extends the existing literature by investigating the timing and the level of earnings surprise in mandatory disclosures (i.e. annual earnings announcements) when CEOs have to exercise their stock options close to expiry; it also tests

[1] CEOs report the date with the highest stock price when they exercise their stock options and sell the shares and the lowest stock price when they exercise stock options and hold the shares. The Sarbanes Oxley Act of 2002 obliged CEOs to report their transactions to the U.S. Securities and Exchange Commission within 2 trading days. Since that time, CEOs backdating ability has been limited.

the level of earnings surprise according to the use of shares (selling or holding shares) obtained from stock option exercises that occur close to expiry. This chapter also tests for earnings manipulation using accruals when CEOs exercise their stock options. CEOs can choose to exercise their stock options around earnings announcements depending on the quality of earnings. Thanks to detailed hand-collected data, I can distinguish manipulation around option exercises from the good timing of stock option exercises. Indeed, timing ability of stock option exercises is limited when CEOs have to exercise stock options that are about to expire.

I start by collecting data on stock option exercises that occurring between 2007 and 2014 made by CEOs of the 116 most important French companies in the SBF120 Index. I find 540 exercises made by 71 CEOs in 67 companies. I split the sample of stock option exercises according to the use of obtained shares. 65.4 % of the stock option exercises are followed by stock sales within 5 trading days of exercise. I take into account the time left to expiry of the options, I construct two subsamples depending on whether the options are exercised during the last quarter (Close to expiry) or before the last quarter (Far from expiry). I find that 18.5 % of stock option exercises occur during the last quarter. Then, I collect data on annual earnings announcements and analyst consensus. Among the 540 stock option exercises, 98 are timed to occur during the 30-day period following annual earnings announcements. 33 % of these option exercises occur close to the option expiration dates.

In this chapter, I present some statistics of analyst forecast revisions made one month before and one month after stock option exercises. I distinguish between upward revisions and downward revisions by comparing the new consensus with the previous one. I find 152 upward revisions (134 downward revisions) before stock option exercises and 156 upward revisions (132 downward revisions) after stock option exercises. Analyst forecast revisions are almost the same before and after stock option exercises.

To distinguish between positive and negative earnings surprise, I compare the earnings per share announced by companies and the final mean analyst forecasts estimate (analysts' consensus). If earnings are higher than (or equal to) analysts' consensus, earnings announcements are considered as positive surprise.

CEOs with stock options may time their stock option exercises to occur shortly before or after earnings announcements depending on the quality of the earnings. However, when the

options are close to their expiration dates, CEOs have to exercise the options before expiry to avoid losing the options. In that case, CEOs might be tempted to increase the earnings to maximize the gain they obtain from stock option exercises. I take the stock option exercises that occur close to expiry and following earnings announcements as exogenous since the expiry dates of the options are not in the control of CEOs. The expiry dates are fixed at the award dates.

The timing of CEO stock option exercises around annual earnings announcements depends on the time left to expiry. CEOs who intend to exercise stock options close to expiry, will have incentives to exercise their stock options shortly after annual earnings announcements that represent good news. By doing so, CEOs will benefit from the announcements of good companies' performance.

CEOs have incentives to increase earnings in order to maximize their benefit especially when they have options close to their expiration dates. I test this behavior by looking at the probability of having good news when CEOs exercise their stock options close to expiry a few days after the earnings announcement dates. Increase in earnings should be stronger when stock options are exercised close to their expiration dates and when the obtained shares are sold. CEOs with stock options that will expire in the near future and who want to sell the obtained shares, should increase their earnings in order to maximize the gains they obtain from stock option exercises. Consistent with these predictions, I find that the probability of positive earnings announcements is 19.6 % higher when the options are exercised close to expiry. I also find that the likelihood of positive surprise increases by 33.5 % when CEOs exercise their stock options close to expiry and sell the obtained shares. These results show CEOs' ability to inflate earnings when they do not have time flexibility to exercise their stock options and when they need liquidity (i.e. they sell the shares). The results of this chapter are consistent with earnings manipulation by CEOs who have to exercise stock options shortly before their expiration dates.

In this study, I control for the dual position of CEOs because those who are also chairmen of the board have access to more valuable information. The results show a lower likelihood of positive earnings surprise when CEOs with dual positions exercise their stock options close to expiry. The results also show that CEOs with dual positions do not change the timing of earnings announcements when they exercise their stock options close to expiry. CEOs with

dual positions might have higher reputation concerns than other CEOs and this may prevent them from behaving opportunistically. These CEOs might be the company founders or major shareholders. I also control for CEO tenure by including a dummy variable coded one if the CEOs are in their last year in position. It seems that CEOs who will shortly leave the executive position do not increase earnings when they exercise their stock options.

Annual earnings are usually announced on almost the same day each year. However, I find a difference in the timing of earnings announcements during a year in which CEOs exercise their stock options close to expiry shortly after the earnings announcements. The time period between the end of the fiscal year and the announcements depends on whether the earnings are higher or lower than analyst forecasts consensus. Companies accelerate earnings announcements when CEOs exercise their stock options close to expiry shortly after positive earnings announcements. The time period between the end of the fiscal year and the earnings announcements is shorter when CEOs have to exercise their stock options close to expiry and decide to sell the obtained shares.

I test for earnings manipulation using accruals. I compute discretionary accruals, that is, the proportion of accruals that CEOs control. I find a higher level of discretionary accruals when CEOs exercise their stock options close to expiry shortly after earnings announcements and obtain a high gain. This result is consistent with earnings manipulation and with the results of Bergstresser and Philippon (2006) and Gopalan et al. (2014).

The remainder of the chapter is organized as follows. Sections 3.2 and 3.3 present the related literature and hypotheses development. Section 3.4 describes the data and presents summary statistics. Section 3.5 presents the empirical methodology and the results. Section 3.5 presents robustness checks and section 3.7 concludes the study.

3.2 Related literature

Several studies investigate CEO stock option awards and exercises. Some studies examine voluntary disclosures around CEO stock option awards and exercises.

Around stock option awards, executives are more likely to disclose bad news before option

awards and to delay the announcement of good news until after the awards. Chauvin and Shenoy (2001) observe a stock price decrease during the 10-day period preceding stock option awards. They attribute this stock price decrease to the timing of good news and bad news around option awards. Executives disclose bad news before option awards and delay the announcement of good news. Aboody and Kasznick (2000) find that CEOs use voluntary disclosures around stock option awards. CEOs delay good news announcements and rush forward bad news announcements. They find that CEOs disclose bad news voluntarily before option awards in order to receive the options at a lower exercise price. Yermack (1997) provide evidence about CEO timing ability to receive stock options shortly before good news announcements. He finds that CEOs influence their compensation committees to grant them stock options before the disclosure of positive quarterly earnings.

Other studies investigate other types of opportunistic behavior. CEOs may manipulate the reporting date of stock option exercises thus enabling them to increase their profits. Cicero (2009) and Cai (2007) find that CEOs backdate their stock option exercises and use their private information to choose when to exercise stock options. These studies find that CEOs report an exercise date in which the stock price was the highest (lowest) when stock option exercises are (not) followed by stock sales.

Some research papers investigate the use of voluntary disclosures around CEO stock option exercises. For example, Brockman et al. (2010) find that CEOs voluntarily disclose more good news when they exercise their stock options and sell shares; however, they disclose more bad news when they exercise the stock options and hold the shares. These authors show that CEOs use their voluntary disclosures to maximize their profits and this behavior is positively related to the value of stock options. Brockman et al. (2010) find that CEOs are able to choose the timing and content of their voluntary disclosures around stock option exercises. They find that the probability of good news announcements is increased by 9% when CEOs exercise their stock options and by 14 % when CEOs exercises their stock options and sell the shares. They also find that CEOs are 5 % more likely to release bad news before stock option exercises that are not followed by stock sales. Brockman et al. (2010) provide evidence of the use of opportunistic (voluntary) disclosures around CEO stock option exercises.

CEOs can also use mandatory disclosures to time their stock option exercises in order

to increase their stock option compensation. They can time their stock option exercises to occur shortly after (before) good (bad) news announcements. In this research, I study mandatory disclosures around stock option exercises. I test whether CEOs time their stock option exercises around some mandatory earnings announcements. I investigate whether the content of mandatory disclosure is different when CEOs exercise their stock options close to expiry. CEOs have the incentives to increase earnings when they intend to exercise their stock options. I take the exercise decision of options with short time left to expiry as exogenous and measure the probability of good news announcements when CEOs exercise their stock options close to expiry. The magnitude of good news announcements (positive earnings) should be related to the use of the obtained shares. To test this prediction, I measure the probability of positive earnings surprise when CEOs exercise their stock options close to expiry and sell/ hold the shares.

In France, CEOs are not allowed to trade on their own companies' stocks a few days before (and sometimes after) earnings announcements. They have to wait until the news become public to trade on their companies' stocks. CEOs who want to exercise their stock options will have the incentives to inflate earnings especially when the options are close to their expiration dates. Since they do not have time to wait, the only way to increase the exercise gain is to increase earnings. In this research I test whether earnings announcements are more likely to represent good news when CEOs exercise their stock options close to their expiration dates shortly after these earnings announcements.

Earnings announcements are made on almost the same day each year; however, CEOs can manipulate the timing of earnings announcements when they want to exercise their stock options. Savor and Wilson (2016) examine the impact of the timing of earnings announcements on stock returns. They find that early announcers earn higher stock returns than late announcers. In this study, I test whether CEO exercise activity impacts the timing of earnings announcements. Around stock option awards, Yermack (1997) finds no significant difference on the timing of quarterly earnings announcements.

I test for earnings manipulation using accruals. Bergstresser and Philippon (2006) show that CEOs with stock based compensation have higher incentives to manage earnings by using a higher level of accruals. Gopalan et al. (2014) study the relation between pay duration,

incentives to manipulate firm performance and level of accruals. They find a higher level of accruals when CEO pay duration is low which reflects CEO efforts to increase short term stock prices by increasing earnings. Gopalan et al. (2014) provide evidence about earnings manipulation by CEOs with short term incentives.

3.3 Hypotheses development

Based on theory and past empirical studies, I construct four hypotheses to test the relation between the magnitude of good news announcements and the exercise decisions of stock options close to expiry. I also test for the timing of earnings announcements when CEOs exercise their stock options after annual earnings announcements and for earnings manipulation using accruals.

The first hypothesis tests for the magnitude of positive earnings announcements before stock option exercises that occur close to expiry. I test whether CEOs who exercise stock options close to expiry impact the quality of earnings announcements.

In other words, I test whether earnings announcements represent more good news when CEOs exercise their stock options with a short time left to expiry, shortly after earnings announcements.

> **Hypothesis 1.** *Positive earnings are more likely to be announced before exercising stock options that are close to their expiry dates.*

CEOs with stock option plans that will soon expire will have higher incentives to release higher earnings in order to exceed (or to meet) analyst forecasts before exercising these options. Because decision to exercise stock options close to expiry is no longer a choice for CEOs who do not want to lose the options, I expect a positive relation between good news announcements and stock option exercises made close to expiry indicating earnings manipulation. Because it is costly, CEOs will engage in manipulation only when the payoff of this behavior is sufficiently high (i.e. when they have to exercise stock options close to expiry). Alternatively, CEOs may time their stock option exercises using their private information. When CEOs know

that earnings exceed analysts' consensus, they will wait until the news become public to exercise their options. In that case, the likelihood of good news announcements should be lower than when exercises occur shortly before expiry. Tests used to measure the effect of stock option exercises on the likelihood of positive earnings announcements should allow to distinguish between earnings manipulation and timing of stock option exercises based on private information. Taking only exercises that occur close to expiry allows to distinguish between earnings manipulation and private information. CEOs without time flexibility should increase earnings before exercising stock options.

Exercises occurring far from expiry could be associated with a significant likelihood of positive surprise. However, this result might be due to the good timing of option exercises to occur after good news announcements. To distinguish between earnings manipulation and information timing of option exercises, I focus on CEOs exercise decisions that does not represent a real choice. I expect a higher likelihood of positive earnings announcements when the exercises occur close to expiry than when the exercises occur far from expiry.

The likelihood of good news announcements is related to the use of the obtained shares. There should be more good news announcements when CEOs exercise their stock options and sell the shares than when they hold shares. CEOs are more likely to exercise their stock options and sell the shares after a higher stock price increase. The stock price increase could be due to the market reaction to the high earnings announcements.

To distinguish between the timing of stock option exercises and earnings manipulation, I take into account only stock options with a short time left to expiry (i.e. stock options exercised close to expiry) and add the long-term stock performance to the tests. Any reversal in stock performance following earnings announcements will indicate earnings manipulation. Earnings manipulation should appear as a decrease in stock prices in the post-earnings announcements period followed by stock option exercises made close to expiry and stock sales. Unlike CEOs who need liquidity and sell the obtained shares, CEOs who intend and/or those obliged to hold shares have tax incentives to exercise their stock options at a lower stock price. Acquisition gains are highly taxed, CEOs will have incentives to exercise at a lower stock price when they hold the shares to fix the acquisition gain, and the subsequent stock price increase will be less taxed. I expect a positive relation between good news announcements and stock option

exercises followed by stock sales and a negative relation between positive surprise and post-earnings stock performance when CEOs exercise their stock options close to expiry and sell the obtained shares which together constitute an indication of earnings manipulation.

The second hypothesis investigates the relation between the likelihood of good news announcements (positive surprise) and the use of the shares obtained from stock option exercises that occur close to expiry.

> **Hypothesis 2.** *There is a higher likelihood of positive earnings announcements are when CEOs exercise their stock options close to expiry and sell the shares.*

The timing of earnings announcements should be related to the content of the announcements. CEOs who intend to exercise their stock options and sell (hold) the shares, should accelerate (delay) good (bad) news announcements. Regarding time left to expiry of the options, CEOs with stock options that are close to expiry should accelerate the announcements especially if the earnings are higher than analysts' consensus (good news).

The third hypothesis examines the relation between the timing of earnings announcements and stock option exercises that occur close to expiry. It also links the timing of earnings announcements and the use of shares obtained from stock option exercises that occur close to expiry

> **Hypothesis 3.** *CEOs accelerate positive earnings announcements when they exercise their stock options close to expiry shortly after these announcements, especially when the obtained shares are sold.*

I expect a positive coefficient on the exercise decision. CEOs accelerate positive earnings announcements when they intend to exercise their stock options in order to benefit from the market reaction. The time period between the end of the fiscal year and the announcement date should be shorter when stock options are exercised close to their expiry dates since CEOs have no time flexibility to choose the exercise date. The alternative hypothesis is that the timing of mandatory disclosure is always the same and is unrelated to CEO exercise activity. If the timing of earnings announcements does not depend on CEO exercise activity, there should be

no significant difference between the timing of earnings announcements whether CEOs exercise their stock options or not.

The last hypothesis investigates earnings manipulation. I compute discretionary accruals and test whether the amount of gain from exercising options close to expiry relative to CEO total annual compensation, impacts the level of discretionary accruals.

> **Hypothesis 4.** *The level of discretionary accruals is higher when CEOs exercise their stock options close to expiry obtaining high gains, compared to their total annual compensation.*

I expect a higher level of discretionary accruals when exercise gains are high meaning that earnings are manipulated upwards when CEOs exercise stock options close to expiry and obtain high exercise gains compared with their total annual compensation. CEOs may use more accruals when they have high incentives. For example, if a company makes large investments, the level of total accruals will be higher due to depreciation, ... However, after removing non-discretionary accruals (expected accruals or those beyond CEO control) from total accruals, the level of discretionary accruals should be the same if there is no manipulation. Furthermore, when earnings are not manipulated, exercise gains which measure CEO incentives do not affect the level of discretionary accruals.

3.4 Data description

Financial and accounting data are provided by Datastream. Earnings announcements data including earnings per share (EPS), earnings announcement dates and analyst forecasts and revisions are collected from the Institutional Brokers Estimate System (I/B/E/S) between 2006 and 2014.

CEO stock option exercises made between January 2007 and December 2014 are collected by hand from companies' annual reports.

I start with 116 French companies constituting the SBF120 index. I exclude 44 companies without stock option exercises during the 8-year period. I also exclude exercises that were not

reported to the AMF [2] and consider exercises made by the same CEO during the same day as one observation. In the sample, there are 540 stock option exercises made by 71 CEOs in 67 French companies. I split the stock option exercise data into subsamples according to the use of the obtained shares (sell/hold) and according to the time left to expiry of the stock options (close to expiry/far from expiry). [3]

I collect data about CEO compensation, position and tenure from companies' annual reports from 2006 to 2015. I construct the sample from the intersection between earnings announcements and CEO stock option exercises and compensation.

To distinguish between good news earnings announcements and bad news announcements, I compute the absolute surprise as the deviation of the actual earnings per share (EPS) from analysts' consensus (mean analyst forecasts) divided by the absolute value of analyst consensus. I focus on annual earnings announcements because in France, companies are not required to disclose earnings for periods other than one year. In I/B/E/S, for a given fiscal year, the database will provide the announcement dates of the interim periods (semester and quarter) however in most cases, the value of EPS will be the same for all interim periods in the same fiscal year. There are 507 earnings announcements made between January 2007 and June 2014 in French companies that have at least one stock option exercise during the event window ($2007 - 2014$).

For a robustness check, I classify announcements following Brockman et al. (2010). I measure the cumulative abnormal returns over the 5-day window surrounding the earnings announcements (CAR[-2; +2]). [4] If this cumulative abnormal return is positive (negative), announcements are classified as good news (bad news).

Table 3.1 presents some statistics of the sample. There are 540 exercises made by CEOs of the largest French companies listed in the Paris Stock Exchange between 2007 and 2014. Almost 2 out of 3 CEO stock option exercises are followed by stock sales. In most cases, the options are exercised prior to the last three months before expiry. 18.5 % of exercises occur

[2] CEOs are required to report their transactions to the AMF (Autorité des Marchés Financiers) within 5 trading days. In the initial sample 23 stock option exercises are not reported to the AMF. The other exercises are usually reported within 1 or 2 trading days.

[3] Stock option exercises are considered as followed by a stock sale if the obtained shares are sold within 5-trading days. To distinguish between stock option exercises that occur close to expiry from those that occur far from expiry, I compute the difference between the exercise date and the expiry date. I consider exercises that occur during the last three months as those made close to expiry and the others as exercises made far from expiry.

[4] Abnormal returns are defined as the excess stock return over market index return (CAC All Tradable Index).

during the last quarter before expiry.

98 stock option exercises occur during the 30-day period following earnings announcements. Earnings announcements are considered as good news if the announced earnings is higher than analyst consensus.

Table 3.1 – **Statistics of the final sample**

This table presents statistics of stock option exercises, earnings announcements and analyst revisions. Earnings announcements followed by stock option exercises are classified as good news or bad news based on the absolute surprise (earnings minus mean analyst forecasts) and cumulative abnormal return measured over a 5-day period surrounding earnings announcements ($CAR[-2;+2]$). Analyst revisions are considered as upward (downward) revisions if the new consensus is higher (lower) than the previous one. Statistics are computed for the whole sample and for subsamples to account for the use of underlying shares (Sale/Holding) and for time left to expiry of the stock options (Far from Expiry/Close to Expiry).

	All Exercises	Sale Subsample	Holding Subsample	Far Subsample	Close Subsample
NB Stock Option Exercises	540	353	187	440	100
		65.4%	34.6%	81.5%	18.5%
NB Stock Option exercises made during the 30 days following annual earnings announcements	98	63	35	66	32
		64.3%	35.7%	67%	33%
Classification of news based on:					
1− Absolute surprise:					
Good News	66	46	20	43	23
		70%	30%	65.2%	34.8%
Bad News	32	17	15	23	9
		53.1 %	46.9%	71.9%	28.1%
2− CAR[-2;+2]:					
Good News	45	25	20	34	11
		55.6%	44.4%	76%	24%
Bad News	53	38	15	32	21
		71.7%	28.3%	60.4%	39.6%
Analyst Forecasts Revisions:	705				
Upward Revisions	308				
Downward Revisions	268				
NB Companies	67				

When earnings announcements are classified as good news and bad news based on the market reaction (CAR[-2 ; +2]), there are more bad news announcements than good news announcements preceding stock option exercises. It seems that the best way to distinguish good

news from bad news announcements is to compare the earnings announced by the companies and the mean analyst consensus (Absolute Surprise). In the remaining part of the chapter, I will use the absolute surprise to measure the level of good news or bad news in the earnings announcements.

As suggested by Gleason and Lee (2003), I keep only revisions for Annual EPS for Fiscal Year 1, i.e. one year ahead annual earnings (periodicity = ANN and Forecast Period Indicator = 1).

Analyst revisions are disclosed on a monthly basis. To distinguish between upward and downward revisions, I compare the new consensus (mean analyst forecasts) with the previous one. There are 705 analyst revisions made 41 days surrounding stock option exercises (20 trading days before and 20 trading days after stock option exercises). 44% of those are upward revisions and 38% downward revisions (18% of same forecasts as the previous ones).

During the month preceding the stock option exercises, there are 152 upward revisions versus 134 downward revisions. The analyst forecast revisions are disclosed on the same day each month. Without any other information, CEOs could use analyst revisions to exercise their stock options. When there is an upward revision, stock prices increase. CEOs can benefit from this good news.

CEOs may time their stock option exercises to occur shortly before or after earnings announcements.

Figure 3.1 presents the number of stock option exercises that occur around annual earnings announcement dates. The frequency of stock option exercises shortly after earnings announcements is higher than in the longer term (the following 10 weeks). CEOs exercise their stock options shortly after the announcements.

In France, CEOs are not allowed to trade on their own stocks during the month preceding (and sometimes a few days following) annual and semi-annual earnings announcements. However, unlike stock and option awards, there is no law that prohibits CEOs from exercising their stock option around earnings announcements. There is only the AMF recommendation that asks CEOs to not trade on their companies' stocks a few days before and after earnings announcements or any important information disclosures.

Some companies in the SBF120 index prohibit insider trading around earnings

announcement dates (on average 21 days before the announcement day and 3 days after the announcement day). These companies implement a "Blackout Period" during which no insiders are allowed to trade on their own stock.

From Figure 3.1, CEOs seem to respect this prohibition of trading. Only a few exercises occur during the 6 weeks preceding the annual earnings announcements (22). CEOs wait until the news become public to exercise their stock options. 117 exercises occur during the 10 weeks following earnings announcements.

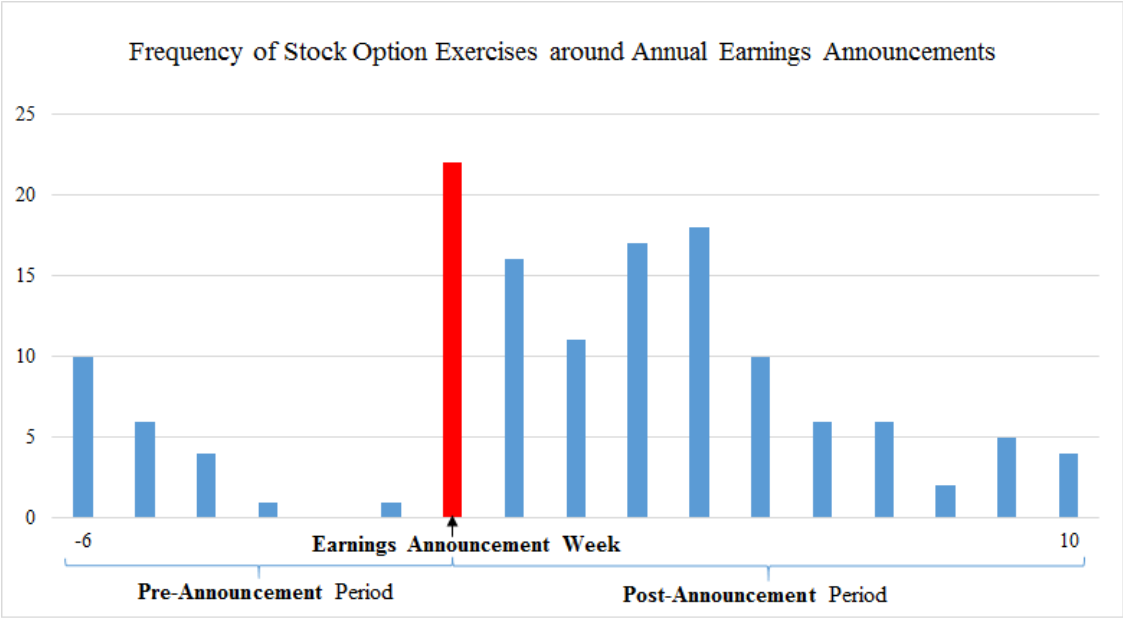

Figure 3.1 – Number of stock option exercises made around annual earnings announcements.

Figure 3.2 presents the exercises made around good news and bad news. During the 6-week period preceding earnings announcements, 3 exercises occur before bad news announcements and 19 exercises occur before good news announcements. From the date of the earnings announcements and during the 10 following weeks, 40 exercises occur after bad news announcements and 77 exercises occur after good news announcements.

CEOs who exercise their stock options shortly after good news earnings announcements (positive surprise), benefit from the market reaction to companies' good performance.

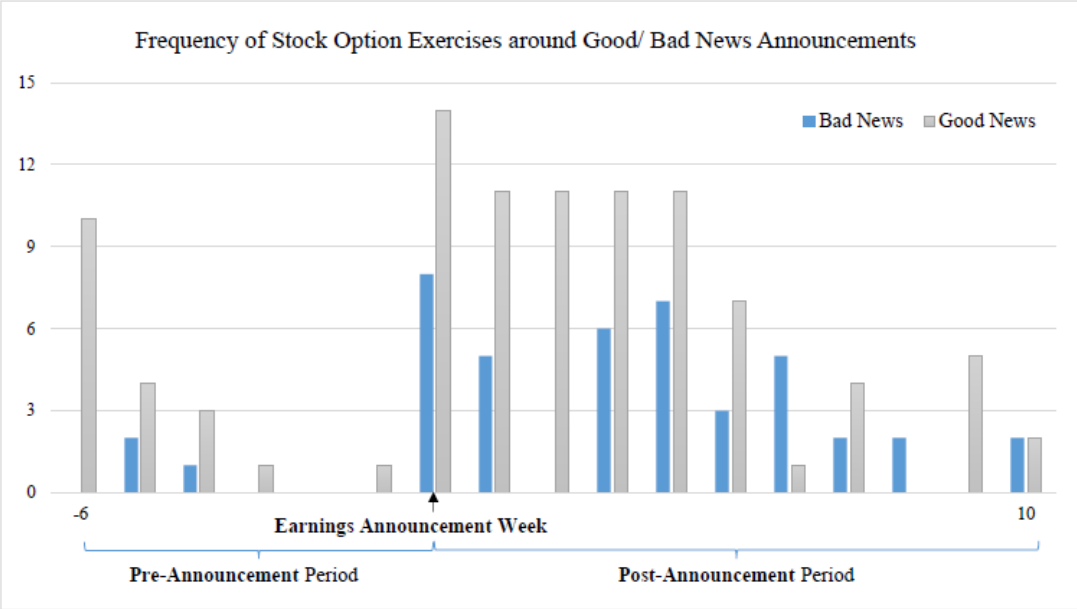

Figure 3.2 – Number of stock option exercises made around good/bad earnings announcements.

Figure 3.3 presents the cumulative abnormal returns (CAR[-20; +120]) around annual earnings announcements. [5]

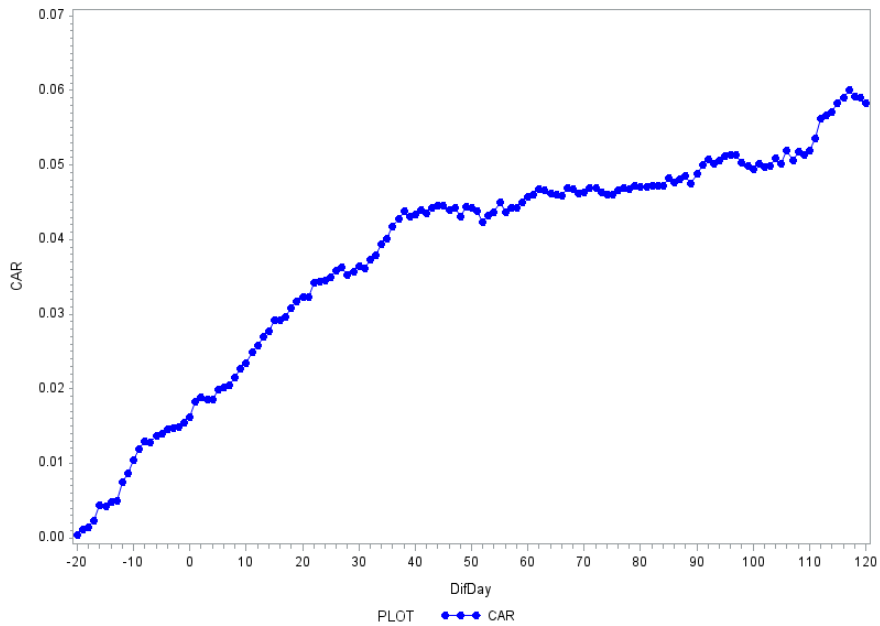

Figure 3.3 – Cumulative Abnormal Returns around Annual Earnings Announcements.

[5] Abnormal returns are estimated using the market model and an estimation period of 6 months ending 1 month before each earnings announcement.

Figure 3.3 shows that the stock prices increase before earnings announcements and continue to increase after annual earnings announcements.

Since CEOs are not allowed to exercise their stock options before earnings announcements, they can time their exercises to occur after the news announcements and benefit from the stock price increase.

Analysts disclose their forecasts revisions on almost the same day of each month. Revisions are classified as good news (1)/bad news (-1)/ neutral news (0) if the average analyst forecasts for the year are revised upwards/downwards or stay the same.

Figure 3.4 plots the frequency of analyst forecasts revisions disclosed one month before and one month after stock option exercises.

This figure (Fig.3.4) shows that upward revisions are more frequent in the pre-exercise period: 42.8% upward revisions versus 38% for downward revisions. However, this is also true for the post-exercise period: 44.6% upward revisions versus 38% for downward revisions.

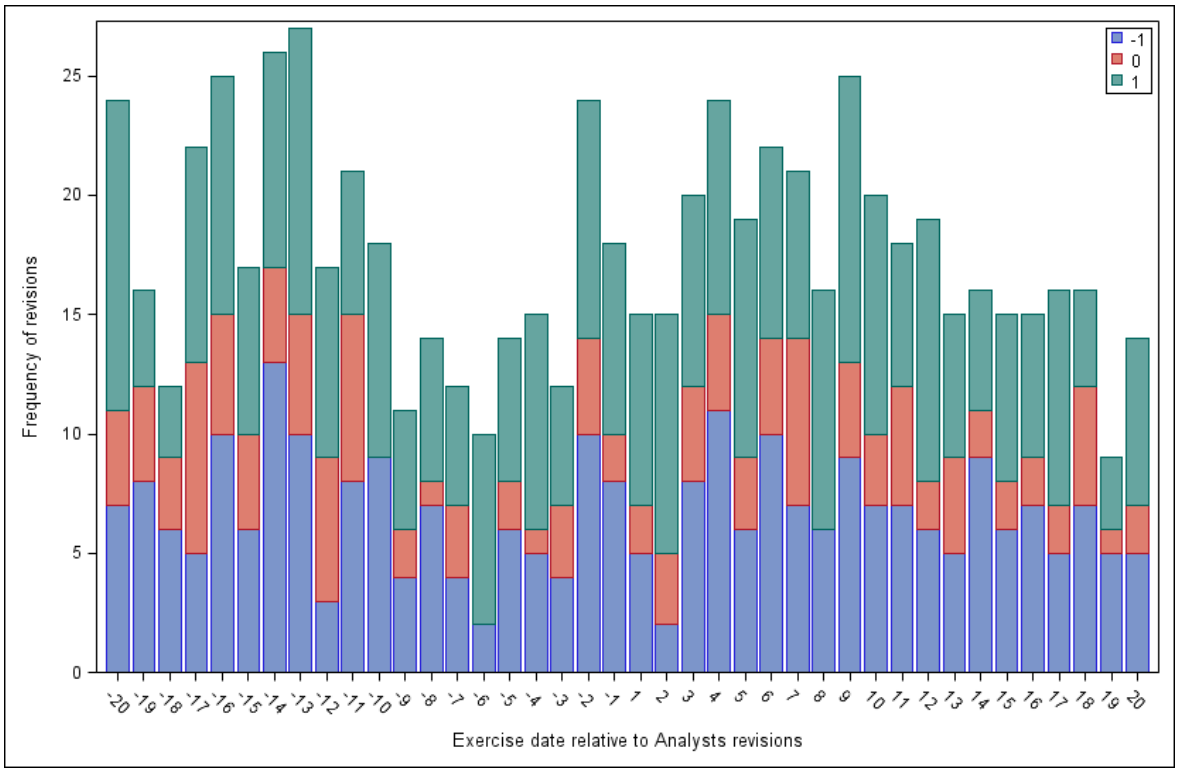

Figure 3.4 – Analyst revisions around stock option exercises.

For the remaining part of the chapter, I focus on annual earnings announcements. I compare earnings announced by companies with the mean analysts' consensus to distinguish between good news and bad news announcements.

To test for the link between earnings announcements and stock option exercises, I take into account all annual earnings announcements made between 2007 and 2014 and count exercises made during the 30-day period following earnings announcements. There are 507 annual earnings announcements made by companies in which CEOs exercise at least one stock option between 2007 and 2014. Earnings announcements are classified as good news if earnings are higher than analysts' consensus.

Table 3.2 presents descriptive statistics of stock option exercises made by CEOs in 67 French companies during the 30-day period following annual earnings announcements. 54.43 % of earnings surprises represent good news.

Earnings announced by companies are 5.75 % higher than the analyst consensus (absolute surprise= 0.0575).

19.33 % of annual earnings announcements are followed by a stock option exercise. In other words, 98 stock option exercises are made during the 30 days following annual earnings announcements. These exercises represent on average 1.9 Million € (the size is computed as the number of options exercised times the exercise price of these stock options).

64.3 % of the exercises made during the 30 days after earnings announcements are followed by stock sales (63 over 98) and 67.3 % are made far from expiry (66 over 98).

CEOs obtain 18.89 % of their total annual compensation from stock option exercises made during the 30-day period following earnings announcements.

To investigate whether CEOs manipulate earnings before exercising their stock options, I consider only the stock options exercised close to expiry dates ($Ex30$ & $Close$). Since CEOs do not have time to choose when to exercise their stock options when the options are close to expiry, option expiry can be taken as an exogenous shock to test for earnings manipulation. I test for manipulation by controlling for the use of the obtained shares from stock option exercises that occur close to expiry.

Table 3.2 – **Descriptive statistics of the final sample**

This table presents descriptive statistics of annual earnings announcements disclosed between 2007 and 2014 and stock option exercises made few days after these annual earnings announcements. $Absolute\ Surprise$ is the difference between the earnings announced by companies and the analyst consensus divided by the absolute value of analyst consensus. $Positive\ Surprise$ is a dummy variable equals one if the Absolute Surprise is higher than zero. $CAR[+30; +120]$ is the cumulative abnormal return in the post-announcement period, calculated using the market model. $CAR[-2; +2]$ is the cumulative abnormal return measured during the 5-day period surrounding annual earnings announcements. $CAR[-2; +2]$ is used to measure the market reaction to the annual earnings announcements. $Ex30$ is a dummy variable that equals 1 if stock options are exercised during the 30 days following earnings announcements. $Size\ of\ stock\ option\ exercises$ is computed as the number of options times the exercise price of stock options. I compute the size of stock option exercises that occur during the 30-day period following earnings announcements according to the use of the obtained shares (Sell/Hold) and according to the time left to expiry of the stock options (Close/Far). $Exercise\ Gain$ is the gain realized at the exercise time relative to total annual compensation. $Market\ Capitalization$ is the market value of equity at the end of the fiscal year preceding the earnings announcement.

	N	Mean	Median	Min	Max	StD
$Absolute\ Surprise$	507	0.0575	0.0052	-5	24	1.2545
$Positive\ Surprise\ (Dummy)$	507	0.5443	1	0	1	0.4985
$CAR[+30; +120]$	507	1.96 %	0.90 %	-70.35 %	123.17 %	22.57 %
$CAR[-2; +2]\ around\ EPS\ Announcements$	507	0.28%	0.38 %	-25.82 %	24.28 %	5.96 %
$-Ex30$	507	0.1933	0	0	1	0.3952
$Size\ of\ stock\ option\ exercises$ (€):						
$-Ex30$	98	1,904,854	920,000	28,360	20,383,000	3,010,444
$-Ex30$ & $Sell$	63	1,822,840	1,102,383	40,904	9,360,468	1,914,560
$-Ex30$ & $Hold$	35	2,052,480	526,973	28,360	20,383,000	4,374,521
$-Ex30$ & $Close$	32	2,901,058	1,956,694	50,500	20,383,000	3,864,182
$-Ex30$ & Far	66	1,421,847	665,815	28,360	16,481,770	2,382,774
$ExerciseGain\ (\%\ of\ Annual\ Compensation)$	98	0.1889	0.1334	0	0.8801	0.1934
$Market\ Capitalization\ (Million$ €)	507	13,402	5,400	74	135,981	20,054
$NB\ Companies$	67					

3.5 Empirical methodology and results

3.5.1 Likelihood of positive surprise preceding stock option exercises

To test hypotheses 1 and 2, I run a probit regression (equation (3.1)). I measure the likelihood of positive surprise when CEOs exercise stock options close to their expiry dates a few days after annual earnings announcements. The main reason for choosing positive surprise as the dependent variable is related to the stock options exercised close to their expiry dates. I consider the options that will expire a few days (or weeks) after the earnings announcements as exogenous and test whether these exercises affect the earnings surprise which would indicate manipulation.

CEOs with stock options that will expire in a few days or weeks do not have time flexibility to choose when to exercise these stock options. CEOs may be tempted to disclose more good news by manipulating the earnings announcements upwards.

$$Pr(Positive\ Surprise_{i,t}) = \alpha_0 + \alpha_1 Ex_{i,(t+0;t+30)}Close + \alpha_2 CAR[+30;+120]_i$$
$$+ \alpha_3 CEO\_Dual_{i,Y} + \alpha_4 CEO\_LastYear_{i,Y} + \alpha_5 BM_{i,Y-1} + \alpha_6 MarketCap_{i,Y-1} + \varepsilon_{i,t} \tag{3.1}$$

t is the announcement date of the annual earnings.

$Positive\ Surprise_{i,t}$ is a dummy variable that equals 1 if the absolute surprise computed as the difference between the announced EPS and the average analyst estimate, all divided by the average analyst estimate, is higher than 0; and 0 otherwise. In a robustness test, I code this dummy variable 1 if the absolute surprise is higher than the sample median and find qualitatively similar results.

$Ex_{i,t+0;+30}Close$ is a dummy variable coded 1 if there is a stock option exercise close to expiry during the 30 days following earnings announcements and 0 otherwise. In a robustness check, I take into account the exercises made during the 60 days following earnings announcements and find similar results.

$CAR[+30;+120]$ is the cumulative abnormal return in the post-announcement period,

calculated using the market model. This variable is used to reveal the existence of a stock price reversal following earnings announcements indicating earnings manipulation. I start the event window at 30 to account for earnings announcements and for option exercises that occur during the 30 days following earnings announcements. For robustness, I use $CAR[+1; +120]$.

Private information could be in the form of earnings manipulation. CEOs with stock options that will shortly expire and/or who know that earnings will not be good in the future may be tempted to increase earnings in order to boost the stock price.

Finding a negative relation between the likelihood of positive surprise and subsequent stock performance could be interpreted as of private information that is the form of earnings manipulation.

I control for CEO characteristics using two dummy variables. $CEO\_Dual_{i,Y}$ equals one if the CEO is also the chairman of the board during the fiscal year. $CEO\_LastYear_{i,Y}$ equals one if the CEO is in his last year in position.

$BM_{i,Y-1}$ and $MarketCap_{i,Y-1}$ are the book to market ratio and the natural logarithm of the previous fiscal year market capitalization (the free-float part), respectively. The use of the whole part of market capitalization does not significantly alter the results.

Table 3.3 reports the probit regression results. I measure the likelihood of positive surprise when earnings announcements are followed by exercises of stock options close to their expiry dates.

In column (1), the coefficient of Ex30Close dummy variable is positive and statistically significant meaning that CEOs are more likely to announce higher earnings before exercising their stock options that are close to expiry. This result is consistent with earnings manipulation. CEOs without time flexibility will increase earnings before exercising stock options. The probability of good news announcements increases by 19.6% (marginal effects) when CEOs exercise stock options close to expiry and shortly after earnings announcements. This result is consistent with earnings manipulation when CEOs have to exercise their stock options before to losing them.

When earnings are manipulated upwards, CEOs benefit most from selling the obtained shares immediately after the stock option exercises. To test whether CEOs are more likely to release more positive surprise when they sell the obtained shares, I combine the exercise

decision of options that have a short time left to expiry ($Ex30Close$) with the use of the obtained shares (Sell/Hold). The results of column (4) show that there is a higher likelihood of positive earnings announcements when CEOs exercise their stock options close to expiry and sell the obtained shares than when they hold the shares. The coefficient of $Ex30Close\_Sell$ dummy variable (0.8569) is positive, statistically significant and larger than the coefficient of $Ex30Close\_Hold$ dummy variable (-0.2216) which is negative and not statistically significant. CEOs release more good news when stock options are close to the expiry date and when the obtained shares are sold shortly after the exercises. The probability of releasing good news increases by 33.5 % when stock options are close to their expiry dates and when the obtained shares are sold. This is consistent with the manipulation of earnings announcements. CEOs who cannot choose when to exercise stock options will release more good news to increase the profit they receive from stock option exercises by manipulating earnings upwards which will boost the stock prices.

Coefficients on CEO characteristics (CEO_Dual and $CEO\_LastYear$) are not significant. CEO characteristics do not impact the disclosure of good news.

The coefficients on book-to-market ratio (BM) are statistically significant only at 10 % level, the probability of observing positive surprise is higher in growth firms.

Firm size ($MarketCap$) is significant meaning that there is a higher likelihood of positive surprise in large companies.

I compute the interaction between the dual position of CEOs and the $Ex30Close$ dummy variable (column (3)). The coefficient is negative and statistically significant at the 1% level. The probability of observing a positive surprise decreases by 73.4% when CEOs with dual positions exercise their stock options close to expiry shortly after earnings announcements. This result can be explained by the reputation concerns of CEOs who are also chairmen of their boards. These CEOs might be the founders or the major shareholders of their companies.

There is a lower likelihood of positive surprise when CEOs with dual positions exercise stock options close to expiry and sell the obtained shares ($-$ 76.9%) than when they hold the shares (result in column (6)). The previous result could be attributed to CEOs who are not chairmen of their boards.

Table 3.3 – **Likelihood of Good News Announcements**

This table reports probit regression results of the probability of positive earnings announcements when CEOs exercise their stock options. $Positive\ Surprise$ is a dummy variable that equals 1 if earnings are higher than analyst consensus. $Ex30Close$ is a dummy variable coded 1 if there is a stock option exercise close to expiry during the 30-days following the earnings announcements. This dummy variable accounts for the use of obtained shares ($Ex30Close\_Sell/Hold$). CEO_Dual and $CEO\_LastYear$ are dummy variables that equal 1 if CEO has a dual position and if CEO is in his last year in position respectively and 0 otherwise. BM is the book to market ratio at the end of previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization at the end of previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable: $Pr(Positive\ Surprise)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Intercept$	0.0818	0.1134	− 0.6733	0.0818	0.1008	− 0.6988	− 0.6726	− 0.8662
	(0.1550)	(0.2905)	(0.0443)	(0.1550)	(0.3485)	(0.0377)	(0.0461)	(0.3808)
$Ex30Close$	0.4972**	0.4811**	1.2079***					
	(0.0403)	(0.0514)	(0.0020)					
$Ex30Close\_Sell$				0.8569**	0.8486***	1.5117***	1.3114***	1.3350***
				(0.0062)	(0.0077)	(0.0025)	(0.0039)	(0.0054)
$Ex30Close\_Hold$				− 0.2216	− 0.2322	0.4050	− 0.2738	− 0.3282
				(0.6005)	(0.5842)	(0.5595)	(0.5420)	(0.4761)
CEO_Dual		0.0185	0.1159		0.0153	0.1157	0.0248	0.0316
		(0.8833)	(0.3738)		(0.9021)	(0.3752)	(0.8453)	(0.8059)
$CEO\_LastYear$		− 0.0872	− 0.1296		− 0.0805	− 0.1436	− 0.0379	− 0.0606
		(0.7084)	(0.5796)		(0.7285)	(0.5398)	(0.8728)	(0.7993)
$Ex30Close \times CEO\_Dual$			− 1.9363***					
			(0.0008)					
$Ex30Close\_Sell \times CEO\_Dual$						− 2.0366***		
						(0.0069)		
$Ex30Close\_Hold \times CEO\_Dual$						− 1.3934		
						(0.1440)		
$CAR[+30;+120]$							− 0.2017	− 0.1005
							(0.4570)	(0.7250)
$Ex30Close\_Sell \times CAR[+30;+120]$							−10.533**	−10.068**
							(0.0463)	(0.0524)
$Ex30Close\_Hold \times CAR[+30;+120]$							1.3379	1.1698
							(0.4541)	(0.5258)
BM			− 0.2183*			− 0.2146*	− 0.1607	− 0.0876
			(0.0661)			(0.0711)	(0.1966)	(0.5041)
$MarketCap$			0.1024***			0.1054***	0.1053***	0.1037***
			(0.0062)			(0.0051)	(0.0119)	(0.0067)
N	507	507	507	507	507	507	507	507

To distinguish between earnings manipulation and private information, I compute abnormal stock performance in the post-earnings announcement period ($CAR[+30; +120]$). CEOs might not manipulate the contents of earnings, however, if they allow earnings announcements knowing that earnings are higher than they should be, this behavior is considered as manipulation.

I compute the interaction between abnormal stock performance in the post-announcement period and the use of the obtained shares, to test whether the stock prices reverse following earnings announcements and stock option exercises that are associated with stock sales. The result presented in column (7) of Table 3.3 shows that there is a negative relation between stock performance following earnings announcements and the likelihood of positive earnings announcements when CEOs exercise their stock options close to expiry and sell the obtained shares shortly after earnings announcements. The results are consistent with private information in the form of earnings manipulation. CEOs make manipulated earnings announcements allowing them to increase their gains from exercising stock options close to expiry. CEOs with options that will shortly expire and/or who know that earnings will not be good in the future, may decide to increase earnings in order to boost the stock price.

Using $CAR[1; +120]$ confirms the previous results. There is a negative and significant relation between the likelihood of positive surprise and the stock performance following option exercises close to expiry and stock sales.

This result confirms the second hypothesis. There is a higher likelihood of positive earnings announcements which is consistent with upwards earnings manipulation when CEOs have to exercise their stock options close to expiry and sell the obtained shares causing a reversal in stock prices.

The results are robust when I use time fixed effects (column(8)).

3.5.2 Timing of earnings announcements

In this part I test whether CEOs or companies accelerate or delay earnings announcements when CEOs intend to exercise their stock options shortly after the release of annual earnings.

Companies release the earnings, on average, 40.18 trading days after the end of the fiscal

year. Table 3.4 presents the average number of trading days companies wait to release the annual earnings after the end of the fiscal year. When CEOs exercise their stock options shortly after earnings announcements, companies seem to accelerate these announcements: 37.49 trading days versus 40.82 trading days when there is no stock option exercise following earnings announcements, the difference is statistically significant at 1% level.

When CEOs exercise their stock options shortly after earnings announcements, companies rush forward the announcement of good news: 34.97 vs 42.68 trading days when the earnings are lower than analyst consensus, the difference is statistically significant at 1% level.

However, when earnings are lower than analyst consensus (i.e. Negative Surprise), companies do not significantly change the timing of earnings announcements whether CEOs exercise their stock options or not.

When earnings are higher than analyst consensus (i.e. Positive Surprise), companies accelerate earnings announcements when CEOs exercise their stock options shortly after these announcements. When earnings are higher than analyst consensus, companies release earnings, on average, 6.28 trading days early when CEOs exercise their stock options after earnings announcements, than when CEOs do not exercise such options. Companies release earnings 34.97 trading days after the fiscal year ends when CEOs exercise their stock options during the 30-day period following the announcements, versus 41.25 trading days after the fiscal year end when the CEOs do not exercise their stock options.

When CEOs exercise their stock options close to expiry shortly after earnings announcements, companies release earnings, on average, 35.19 trading days after the end of the fiscal year. When the earnings represent positive surprise, companies accelerate the announcements. Companies wait only 33.87 to release the positive surprise when CEOs have to exercise their stock options close to expiry (earnings announcements are made 40.28 trading days after the end of the fiscal year when CEOs do not exercise their stock options close to expiry).

Results in Table 3.4 indicate that the timing of mandatory disclosures depends on whether CEOs exercise their stock options shortly after earnings announcements or not. It also depends on the time left to expiry of stock options and on whether earnings are higher or lower than analyst forecasts (i.e. positive or negative surprise).

Table 3.4 – **Timing of Earnings Announcements − Difference**

This table presents the average number of trading days that separates annual earnings announcement date from the end of the fiscal year FYE_ANN. The number of trading days between the end of the fiscal year and the earnings announcements is computed in the case in which annual earnings announcements are followed by CEO stock option exercises "$Ex30$", stock option exercises made close to expiry $Ex30Close$ and in the other cases "$No\ Ex30$"; $No\ Ex30Close$. The time period between the fiscal year end date and the earnings announcements date accounts for the quality of earnings, it takes into account whether the earnings are higher than the analyst consensus "Positive Surprise" or below the analyst consensus "Negative Surprise". Significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

Average FYE_ANN	***Earnings Announcements***			***Difference***
	All	*Positive Surprise* (1)	*Negative Surprise* (2)	(1) − (2)
$Ex30$	37.49	34.97	42.68	− 7.71***
$NoEx30$	40.82	41.25	40.36	0.89
Difference	− 3.33	− 6.28***	2.32	
$Ex30Close$	35.19	33.87	38.56	− 4.69
$NoEx30Close$	40.51	40.28	40.77	0.49
Difference	5.32***	6.41***	2.21	

To test for the timing of earnings announcements when CEOs have to exercise their stock options close to expiry (Hypothesis 3), I estimate the following model:

$$FYE\_ANN_{i,t} = \alpha_0 + \alpha_1 Positive\,Surprise_{i,t} + \alpha_2 Ex_{i,(t+0;t+30)}Close + \alpha_3 CEO\_Dual_{i,Y} + \alpha_4 CEO\_LastYear_{i,Y} + \alpha_5 BM_{i,Y-1} + \alpha_6 MarketCap_{i,Y-1} + \varepsilon_{i,t} \quad (3.2)$$

$FYE\_ANN_{i,t}$ is the number of trading days between the fiscal year end date and the earnings announcement date t of firm i.

$Positive\,Surprise_{i,t}$ is a dummy variable that equals 1 if the absolute surprise computed as the difference between the announced EPS and the average analyst estimate, all divided by the average analyst estimate (analyst forecasts or consensus), is higher than 0; and 0 otherwise.

$Ex_{i,t+0;+30}Close$ ($Ex30Close$) is a dummy variable which equals 1 if there is a stock option exercise during the 30 days following earnings announcements and 0 otherwise.

$CEO\_Dual_{i,Y}$ equals 1 if the CEO is also the chairman of the board during the fiscal year.

$CEO\_LastYear_{i,Y}$ equals 1 if the CEO is in his last year in position.

$BM_{i,Y-1}$ and $MarketCap_{i,Y-1}$ are the book to market ratio and the natural logarithm of the end of previous fiscal year market capitalization (free-float), respectively. The results are not sensitive to the use of the whole part of market capitalization.

Table 3.5 presents the OLS (Ordinary Least Squares) regression results. In the first column, I use only $Ex30Close$ dummy variable as independent variable. The coefficient of $Ex30Close$ is negative and significant at 1% level. Companies in which CEOs exercise stock options close to expiry accelerate earnings announcements. CEOs with stock options close to their expiry dates will accelerate earnings announcements in order to benefit from the market reaction.

Results in column (2) show that the $Positive\ Surprise$ dummy variable is negative and not statistically significant. Companies do not accelerate positive earnings announcements. The incentives to accelerate earnings announcements might come from CEO exercise decision especially when options are close to expiry. I compute the interaction between the magnitude of good news ($Positive\,Surprise$ dummy variable) and the CEO exercise decision close to expiry shortly after the earnings announcements.

The results presented in column (8) show that earnings higher than analysts' consensus (i.e. Positive Surprise) will be released even more quickly when CEOs exercise their stock options close to expiry shortly after the announcements. The coefficient of the interaction between CEO exercise activity close to expiry and the positive surprise dummy variable is negative and highly significant.

The results show that CEOs who do not have time to choose when to exercise their stock options (options close to their expiry dates) have incentives to accelerate earnings announcements when earnings exceed the analyst consensus.

In column (6), I control for the use of the obtained shares. The coefficient of $Ex30Close\_Sell$ is negative and highly significant meaning that companies accelerate earnings announcements when their CEOs exercise their stock options close to expiry and sell the obtained shares.

Table 3.5 – **Timing of Earnings Announcements**

This table reports OLS regression results of the time period between the fiscal year end and the earnings announcement date on $Positive\,Surprise_{i,t}$ which is a dummy variable coded 1 if earnings are higher than analyst consensus, $Ex30Close$ is a dummy variable coded 1 if there is a stock option exercise close to expiry during the 30-day period following earnings announcements. This dummy variable accounts for the use of obtained shares ($Ex30Close\_Sell/Hold$). CEO_Dual and $CEO\_LastYear$ are dummy variables that equal 1 if CEO has a dual position and if CEO is in his last year in position respectively. BM is the book to market ratio at the end of previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization at the end of previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable: FYE_ANN							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	40.514	40.891	61.814	62.082	40.834	62.072	62.907	62.191
	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)
$PositiveSurprise$		− 0.7078	0.1805	0.481	− 0.601	0.335	0.5608	0.5957
		(0.4917)	(0.8553)	(0.6315)	(0.5604)	(0.7352)	(0.5758)	(0.5611)
$Ex30Close$	− 5.3262***	5.1944***	5.0476***	8.1194***				0.3571
	(0.0114)	(0.0140)	(0.0147)	(0.0001)				(0.8810)
$Ex30Close\_Sell$					− 6.7285***	7.2467***	10.4924***	
					(0.0067)	(0.0028)	(< .0001)	
$Ex30Close\_Hold$					− 1.3445	0.2615	2.5440	
					(0.7281)	(0.9434)	(0.2106)	
$Ex30Close \times CEO\_Dual$				8.9247***				
				(0.0111)				
$Ex30CloseSell \times CEO\_Dual$							13.7117***	
							(0.0001)	
$Ex30CloseHold \times CEO\_Dual$							− 4.0882	
							(0.4077)	
$Ex30Close \times PositiveSurprise$								−7.7957***
								(0.0172)
CEO_Dual			− 1.2063	− 1.8078		− 1.3608	− 1.7997	− 1.5173
			(0.2674)	(0.1155)		(0.2115)	(0.1178)	(0.1760)
$CEOLYear$			1.0061	1.1160		1.0834	1.2039	0.8277
			(0.6196)	(0.5755)		(0.5923)	(0.5495)	(0.6769)
BM			− 1.47579	− 1.4307		− 1.5148	− 1.5425*	− 1.5102*
			(0.1462)	(0.1025)		(0.1352)	(0.0798)	(0.0836)
$MarketCap$			−2.4069***	2.4111***		−2.4324***	−2.5096***	− 2.4487
			(< .0001)	(< .0001)		(< .0001)	(< .0001)	(< .0001)
$Adj - Rsquare$	0.0107	0.0096	0.1070	0.1127	0.0104	0.1106	0.1182	0.1106
N	507	507	507	507	507	507	507	507

The exercise decision close to expiry of CEOs who hold the shares does not have any impact on the timing of earnings announcements, $Ex30Close\_Hold$ is negative but not significant. Companies do not change the timing of their earnings announcements when CEOs exercise their stock options close to expiry and hold the obtained shares.

In columns (4) and (7), I compute the interaction between the $Ex30Close$ dummy variable and the dual positions of CEOs. CEOs who are also chairmen of their boards do not accelerate earnings announcements. This result might be related to the reputation concerns of CEOs with dual positions. Their reputation concerns give them higher incentives not to manipulate the timing of earnings announcements. The results show that CEOs with non-dual positions accelerate the announcement of earnings when they exercise their stock options close to expiry and sell the obtained shares.

CEOs in their last year in position do not impact the timing of earnings announcements ($CEOLYear$ is not significant).

The BM coefficient is negative but not always significant. Some value firms accelerate earnings announcements. Large firms seem to accelerate earnings announcements (the coefficient on $MarketCap$ is negative and highly significant).

3.5.3 Earnings manipulation

CEOs who intend to exercise their stock options may use a higher level of accruals in order to boost earnings. Accruals are components of earnings that do not appear in cash flows (e.g. accounts payable, accounts receivable, deferred tax liabilities, etc.). Following Bergstresser and Philippon (2006), I compute the discretionary accruals (those CEOs control) by removing the non-discretionary accruals (those beyond CEO control) from the total accruals.

I use the Jones model (1991) to estimate the total accruals using income and cash-flow statements. I compute the total accruals as the difference between Earnings Before Extraordinary Items (EBXI) and Cash Flow from Operations. I normalize the total accruals by the lagged value of total assets.

$$TA_{i,t} = \frac{EBXI \; - \; CF\,Operations}{A_{i,t-1}} \tag{3.3}$$

I run the following regression using data from 1980 to 2015:

$$TA_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2(\Delta Rev_{i,t}) + \alpha_3 PPE_{i,t} + \varepsilon_{i,t} \tag{3.4}$$

Year t is the year of earnings announcement. $\Delta Rev_{i,t}$ is the one-year change in sales or revenue of the company i normalized by the lagged value of total assets.
$PPE_{i,t}$ is the gross Property, Plant and Equipment normalized by the lagged value of total assets. Then, I estimate the non-discretionary accruals using the coefficients estimated in the regression of Total Accruals (eq. (3.4)):

$$NonDA_{i,t} = \hat{\alpha_0} + \hat{\alpha_1} \left(\frac{1}{A_{i,t-1}} \right) + \hat{\alpha_2}(\Delta Rev_{i,t}) + \hat{\alpha_3} PPE_{i,t} \tag{3.5}$$

Discretionary accruals are those not explained by the model (eq.(3.4)). I estimate the discretionary accruals ($DA_{i,t}$) included in the earnings announced by company i at year t as the difference between total accruals and estimated non-discretionary accruals.

$$DA_{i,t} = TA_{i,t} - NonDA_{i,t} \tag{3.6}$$

Unlike Bergstresser and Philippon (2006) who take the absolute value of accruals arguing that manipulation could move earnings upwards by increasing accruals or downwards by using less accruals, I use the value of accruals as it is (I keep the sign of accruals); since I test whether CEOs increase earnings using more accruals when their stock option incentives are high.

For robustness checks, I estimate equation (3.4) using the modified Jones model. I use $\Delta Revenue - \Delta Net\ Receivables$ instead of $\Delta Revenue$, the result is qualitatively similar. I also add the Return on Asset (ROA) to the total accruals, and estimate equation (3.4) by industry, the result is similar to the previous ones.

CEOs may use a higher level of accruals when they want to exercise their stock options. The level of accruals should be related to the level of the exercise gain relative to total annual compensation. If CEOs have only a few options to exercise, the incentive to manage earnings are not high compared with when they have to exercise a large number of options that represent a large proportion of their total annual compensation.

Table 3.6 presents the OLS regression results using discretionary accruals as the dependent variable. The $Ex30Close$ dummy variable is negative and statistically significant suggesting that CEOs do not use a higher level of accruals when they want to exercise their stock options close to expiry. This result would reject hypothesis 4. However, if CEOs have only a few stock options, they do not have high incentives to manipulate earnings using more accruals.

To control for the importance of stock option exercises relative to CEO total annual compensation and thus for the level of incentives to manipulate earnings, I use the Exercise Gain obtained from stock option exercises close to expiry made during the 30-days following earnings announcements divided by total annual compensation ($ExGain\_Close$). [6] The sample size drops to 32 when I use the Exercise Gain obtained from option exercises made close to expiry during the 30-day period following annual earnings announcements. $ExGain\_Close$ is positively related to the level of discretionary accruals indicating a higher level of manipulation. Large gains from stock option exercises close to expiry give CEOs higher incentives to manipulate earnings by using more accruals in the earnings they announce shortly before exercising stock options close to expiry.

I drop the CEO_Dual dummy variable from the regression because of its strong correlation with the exercise gain $ExGain\_Close$. The result is robust to the control for CEO last year in position and for firm characteristics. There is a higher level of accruals in value firms.

The regression results show that CEOs with high incentives boost earnings by using a higher level of discretionary accruals. This result is consistent with Gopalan et al. (2014) who find that CEOs with short term incentives use more accruals to increase earnings.

For robustness checks and to make the exercise gain independent from the impact of earnings announcements on stock prices, I use the stock price one month before the announcement date to compute the exercise gain. I find a higher level of discretionary accruals when CEOs obtain an important gain from their stock option exercises made close to expiry. This result supports the hypothesis that CEOs with a higher level of incentives use more accruals to increase earnings and therefore increase their gain.

[6] $ExGain\_Close$: the exercise gain relative to CEO total annual compensation. $ExGain\_Close = \frac{Number\ of\ Options \times (Strike\ Price - Stock\ price\ at\ the\ exercise\ date)}{Total\ Annual\ Compensation}$.

Table 3.6 – **Earnings Manipulation**

This table reports OLS regression results of discretionary accruals ($DA_{i,t}$) on $Ex30Close$ dummy variable which equals 1 if there is a stock option exercise close to expiry during the 30 days following earnings announcements. $ExGain\_Close$ is the exercise gain relative to CEO annual compensation. $Positive\ Surprise_{i,t}$ is a dummy variable coded 1 if earnings are higher than analyst consensus. $CEO\_LastYear$ is a dummy variable equal one if the CEO is in his last year in position. BM is the book to market ratio at the end of previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization at the end of previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

Dependent Variable: *Discretionary Accruals*				
	(1)	(2)	(3)	(4)
$Intercept$	-0.0027	-0.02838	-0.0978	-0.0978
	(0.4187)	(0.0873)	(0.0284)	(0.0190)
$Ex30Close$	-0.0215^{**}			
	(0.0216)			
$Positive\ Surprise$	0.0131^{***}	-0.0064	-0.0009	-0.0053
	(0.0042)	(0.6658)	(0.9477)	(0.7165)
$ExGain\_Close$		0.13657^{***}	0.09117^{**}	0.0855^{*}
		(0.0066)	(0.0224)	(0.0928)
$CEOLYear$				-0.0558
				(0.1878)
BM			0.0319	0.0600^{*}
			(0.2244)	(0.0781)
$MarketCap$			0.0056	0.0060
			(0.2347)	(0.2014)
$Adj-Rsquare$	0.0203	0.3086	0.3743	0.3930
N	507	32	32	32

3.6 Robustness checks

For robustness checks, I compute the likelihood of positive surprise using all exercises made during the 30 days following the annual earnings announcements.

The results presented in table 3.7 are consistent with earnings manipulation when CEOs exercise their stock options shortly after annual earnings announcements.

The interaction between CEO duality and their exercise decisions shows a lower likelihood of positive surprise regardless of the time left to expiry or the use of the obtained shares.

Conditioning only on the use of the obtained shares does not provide evidence about

stock price reversal following option exercises. The interaction between $Ex30\_Sell/Hold$ and $CAR[+30; +120]$ is positive but not significant.

Table 3.8 presents the regression results of the time between the end of the fiscal year and the earnings announcement date. The results in column (1) show that companies where CEOs exercise stock options accelerate earnings announcements ($Ex30$ is negative and significant at 1% level).

CEOs without time flexibility accelerate earnings announcements. The results in column (4) of Table 3.8 indicate that earnings announcements occur more quickly when CEOs exercise their stock options close to expiry than when they exercise stock options far from expiry. Stock option exercises that occur far from expiry have no impact on the timing of earnings announcements. This is consistent with the fact that CEOs with time flexibility could choose to exercise their stock options during another period. The interaction between exercise decisions (column(5)), time left to expiry and CEO dual position indicates that CEOs with dual positions do not accelerate earnings announcements when they exercise stock options shortly after the announcements. When dual CEOs exercise their stock options, the timing of earnings announcements does not depend on whether the options are exercised close to expiry or far from expiry.

CEOs may inflate earnings using a higher level of accruals. To check for the robustness of the previous results which are consistent with the use of more accruals when CEOs have to exercise their stock options close to expiry, I consider all exercises that occur shortly after earnings announcements without conditioning on the time left to expiry of stock options. Table 3.9 shows a higher level of discretionary accruals when CEOs have high incentives ($ExGain$ is positive and highly significant).

Table 3.7 – **Likelihood of Good News Announcements**

This table reports probit regression results of the probability of positive earnings announcements when CEOs exercise their stock options. $Positive\ Surprise$ is a dummy variable that equals 1 if earnings are higher than analyst consensus. $Ex30$ is a dummy variable coded 1 if there is a stock option exercise during the 30-day period following earnings announcements. This dummy variable accounts for time to options expiry ($Ex30\_Close/Far$) and for the use of obtained shares ($Ex30\_Sell/Hold$). CEO_Dual and $CEO\_LastYear$ are dummy variables that equal 1 if the CEO has a dual position and if the CEO is in his last year in position respectively and 0 otherwise. BM is the book to market ratio at the end of previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization at the end of previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable: $Pr(Positive\ Surprise)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.0337	− 0.6293	− 0.7793	0.0337	− 0.7697	0.0337	− 0.8537	− 0.6204
	(0.5865)	(0.0593)	(0.0208)	(0.5865)	(0.0227)	(0.5865)	(0.0117)	(0.0650)
$Ex30$	0.4158***	0.3209**	1.1519***					
	(0.0042)	(0.0317)	(< .0001)					
$Ex30Close$				0.5454**	1.3305***			
				(0.0252)	(0.0007)			
$Ex30Far$				0.3557**	0.9730***			
				(0.0367)	(0.0089)			
$Ex30Sell$						0.5796***	1.5556***	0.4946***
						(0.0013)	(< .0001)	(0.0073)
$Ex30Hold$						0.1463	0.2287	0.0997
						(0.5098)	(0.6300)	(0.6755)
$Ex30 \times CEO\_Dual$			− 1.2347***					
			(0.0002)					
$Ex30Close \times CEO\_Dual$					− 2.0422***			
					(0.0004)			
$Ex30Far \times CEO\_Dual$					− 0.9298**			
					(0.0267)			
$Ex30Sell \times CEO\_Dual$							− 1.6905***	
							(0.0001)	
$Ex30Hold \times CEO\_Dual$							− 0.2515	
							(0.6406)	
CEO_Dual		− 0.0183	0.2193		0.2203		0.2178	0.0261
		(0.8833)	(0.1176)		(0.1160)		(0.1201)	(0.8386)
$CEOLYear$		− 0.0883	− 0.1029		− 0.1208		− 0.0950	− 0.1122
		(0.7079)	(0.6620)		(0.6088)		(0.6855)	(0.6356)
$CAR[+30;+120]$								− 0.2670
								(0.3450)
$Ex30\_Sell \times CAR[+30;+120]$								1.3102
								(0.3686)
$Ex30\_Hold \times CAR[+30;+120]$								1.0717
								(0.3475)
BM		− 0.1799	− 0.1767		− 0.1833		− 0.1629	− 0.1514
		(0.1332)	(0.1403)		(0.1268)		(0.1743)	(0.2279)
$MarketCap$		0.1007***	0.0980***		0.0975***		0.1061***	0.0943***
		(0.0071)	(0.0088)		(0.0094)		(0.0048)	(0.0129)
N	507	507	507	507	507	507	507	507

Table 3.8 – **Timing of Earnings Announcements**

This table reports OLS regression results of the time period between the fiscal year end and the earnings announcement date on $Positive\ Surprise_{i,t}$ is a dummy variable coded 1 if the earnings announced are higher than analyst consensus, $Ex30Close$ is a dummy variable coded 1 if there is a stock option exercise during the 30-day period following earnings announcements. This dummy variable accounts for time to options expiry ($Ex30\_Close/Far$) and for the use of obtained shares ($Ex30\_Sell/Hold$). CEO_Dual and $CEO\_LastYear$ are dummy variables that equal 1 if the CEO has a dual position and if the CEO is in his last year in position respectively and 0 otherwise. BM is the book to market ratio computed at the end of the previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization measured at the end of the previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

	Dependent Variable: FYE_ANN							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Intercept$	40.821	61.683	63.115	61.867	63.105	62.008	64.193	61.894
	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)
$PositiveSurprise$		0.2187	0.8518	0.2551	0.8555	0.3432	1.0950	2.1242*
		(0.8257)	(0.3956)	(0.7971)	(0.3968)	(0.7310)	(0.7640)	(0.0534)
$Ex30$	−3.3317***	2.7398***	9.1525***					4.1533***
	(0.0101)	(0.0315)	(< .0001)					(0.0156)
$Ex30Close$				− 5.3207***	9.5012***			
				(0.0107)	(< .0001)			
$Ex30Far$				− 1.5646	−8.7288***			
				(0.2887)	(0.0002)			
$Ex30Sell$						− 4.2501***	11.6423***	
						(0.0019)	(< .0001)	
$Ex30Hold$						− 0.1382	0.3349	
						(0.9450)	(0.8655)	
$Ex30 \times CEO\_Dual$			10.1793***					
			(< .0001)					
$Ex30Close \times CEO\_Dual$					10.4843***			
					(0.0033)			
$Ex30Far \times CEO\_Dual$					9.7651***			
					(0.0006)			
$Ex30Sell \times CEO\_Dual$							13.7341***	
							(< .0001)	
$Ex30Hold \times CEO\_Dual$							− 0.5156	
							(0.8735)	
$Ex30 \times PositiveSurprise$								− 10.7121***
								(< .0001)
CEO_Dual		− 0.8610	− 3.1129***	− 1.1740	− 3.1136***	− 1.1014	− 3.1097***	− 1.6699
		(0.4213)	(0.0113)	(0.2805)	(0.0115)	(0.3014)	(0.0052)	(0.1203)
$CEOLYear$		1.0605	1.0897	0.9822	1.0863	1.1796	0.7401	1.3777
		(0.6012)	(0.5842)	(0.6279)	(0.5868)	(0.5454)	(0.7170)	(0.4786)
BM		− 1.6193	− 1.6604*	− 1.63161	− 1.6570*	− 1.6399*	− 1.8658**	− 1.4652*
		(0.1151)	(0.0623)	(0.1119)	(0.0636)	(0.0652)	(0.0383)	(0.0959)
$MarketCap$		− 2.3854***	2.3994***	2.3811***	2.3986***	2.4114***	− 2.5274***	− 2.4773***
		(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)	(< .0001)
$Adj - Rsquare$	0.0111	0.1046	0.1308	0.1072	0.1274	0.1084	0.1418	0.1323
N	507	507	507	507	507	507	507	507

Table 3.9 – **Earnings Manipulation**

This table reports OLS regression results of discretionary accruals ($DA_{i,t}$) on $Ex30$ dummy variable which equals 1 if there is a stock option exercise during the 30 days following earnings announcements. $ExGain$: is the exercise gain relative to CEO annual compensation. $Positive\ Surprise_{i,t}$ is a dummy variable coded 1 if earnings are higher than analyst consensus. CEO_Dual and $CEO\_LastYear$ are dummy variables equal 1 if CEO has a dual position and if CEO is in his last year in position respectively. BM is the book to market ratio at the end of previous fiscal year. $MarketCap$ is the natural logarithm of market capitalization at the end of previous fiscal year. p-values are presented between parentheses and significance at 10%, 5% and 1% is represented by *, ** and *** respectively.

Dependent Variable: $Discretionary\ Accruals$			
	(1)	(2)	(3)
$Intercept$	-0.0018	-0.0153	-0.1105
	(0.5976)	(0.0422)	($<.0001$)
$Ex30$	-0.0126^{**}		
	(0.0296)		
$Positive\ Surprise$	0.0134^{***}	-0.0016	0.0006
	(0.0036)	(0.8274)	(0.9283)
$ExGain$		0.0588^{***}	0.0498^{***}
		(0.0019)	(0.0052)
CEO_Dual			
$CEOLYear$			-0.0248
			(0.1392)
BM			0.0366^{***}
			(0.0044)
$MarketCap$			0.0092^{***}
			(0.0008)
$Adj-Rsquare$	0.0192	0.0829	0.2003
N	507	98	98

3.7 Conclusion

Past studies examine CEO behavior around stock option awards and exercises. Some of them find that CEOs use their private information. Other studies find that CEOs use voluntary disclosure around stock option awards and exercises.

In this research, I investigate the likelihood of good news announcements (i.e. positive surprise) when CEOs exercise their stock options shortly after annual earnings announcements. The results show that CEOs release more good news when they have to exercise their stock options that are about to expire. Earnings announcements are 19.6 % more likely to represent

good news when CEOs exercise their options close to expiry, which is consistent with earnings manipulation. When CEOs do not have time to choose when to exercise their stock options, they increase earnings in order to increase stock prices to maximize their exercise gains.

The effect on news announcements of option exercises made close to expiry is stronger when the obtained shares are sold. Stock option exercises made close to expiry followed by stock sales enhance the probability of good news announcements by 33.5 %. However, CEOs with dual positions are less likely to release more positive surprise before exercising stock options close to expiry; this might be explained by reputation concerns or by the fact that these CEOs may be the founders or major shareholders of their companies. The role of corporate governance on option exercise behavior should be addressed in future research.

Earnings manipulation should show a stock price reversal (i.e. negative stock performance) in the post-earnings announcement period. Result displays a negative relation between the likelihood of positive surprise and the post-announcement performance when CEOs exercise stock options close to expiry shortly after earnings announcements and sell the obtained shares. This result is consistent with earnings manipulation before exercising stock options.

I examine the timing of earnings announcements relative to the contents of earnings announcements and relative to CEO exercise activity close to expiry shortly after earnings announcements. I find that companies accelerate announcements of earnings when CEOs exercise their stock options close to expiry shortly after positive earnings announcements, especially when the obtained shares are sold.

I test for earnings manipulation using accruals. I find a positive relation between the level of discretionary accruals and CEO incentives. CEOs use a higher level of discretionary accruals when they exercise stock options close to expiry (shortly after earnings announcements) and obtain a large gain compared to their total annual compensation. In robustness checks, the results show that CEOs use a higher level of discretionary accruals when they have high incentives from stock option exercises regardless of the time left to option expiry.

Overall, it seems that CEOs manipulate both the contents and the timing of mandatory disclosures before exercising stock options.

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CEO Stock Option Exercises: Private Information and Earnings Announcements

This dissertation contains three chapters. Chapter 1 presents a description of stock option compensation and discusses the existing literature on stock option awards and exercises. Chapter 2 investigates CEO exercise behavior in the most important French companies. The results provide evidence of information timing of option exercises. Chapter 3 examines annual earnings announcement and its relation with CEO exercise decisions. The results of this chapter indicate that earnings are more likely to exceed analyst forecasts when CEOs exercise their options close to expiry shortly after the announcements. The likelihood of positive surprise increases when option exercises are followed by stock sales. The results also show CEO timing ability. CEOs accelerate earnings announcements when they have to exercise their stock options close to expiry, especially when they sell the obtained shares. Chapter 3 shows that CEOs use a higher level of discretionary accruals when they have to exercise options that are about to expire.

Keywords: Stock options, Exercise, Private Information, Timing, Backdating, Earnings Announcements, Accruals.

Exercice de Stock-Options des Dirigeants : Information Privée et Annonce de Résultats

Cette thèse comprend trois chapitres. Le Chapitre 1 présente des généralités sur les stock-options et synthétise la littérature existante sur les attributions et les exercices de stock-options. Le Chapitre 2 examine le comportement d'exercice des dirigeants dans les plus grandes entreprises françaises. Les résultats fournissent des preuves de l'utilisation d'informations privées pour exercer les options loin de l'expiration. Le Chapitre 3 examine l'annonce des résultats annuels et sa relation avec la décision d'exercice des stock-options des dirigeants. Les résultats de ce chapitre indiquent que les résultats annuels sont plus susceptibles de dépasser les prévisions des analystes quand les dirigeants exercent leurs options proches de l'expiration peu de temps après les annonces. La probabilité d'annonces de résultats positifs est également plus élevée lorsque les dirigeants exercent leurs options et revendent les actions obtenues. Les résultats montrent également la capacité de synchronisation des dirigeants. Ils accélèrent les annonces de résultats quand ils doivent exercer leurs options à proximité de l'expiration, en particulier lorsqu'ils vendent les actions obtenues. Le Chapitre 3 montre que les dirigeants utilisent un niveau plus élevé d'Accruals discrétionnaires lorsqu'ils doivent exercer des options à expiration.

Mots Clés : Stock-Options, Exercice ou Levée, Timing, Information Privée, Annonce de résultats, Accruals.